FIS

FINISHES & INTERIORS SECTOR

SPECIFIERS' GUIDE
DRYLINING

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(Employers correct as of February 2022)

FOREWORD

Specifying drylining seems, on the face of it, simple enough: consider the look, performance and cost, and there it is. If only it were that simple there would not be cases where evidence of fire compartmentation could fail or fail to perform because the issue wasn't apparent during the specification process.

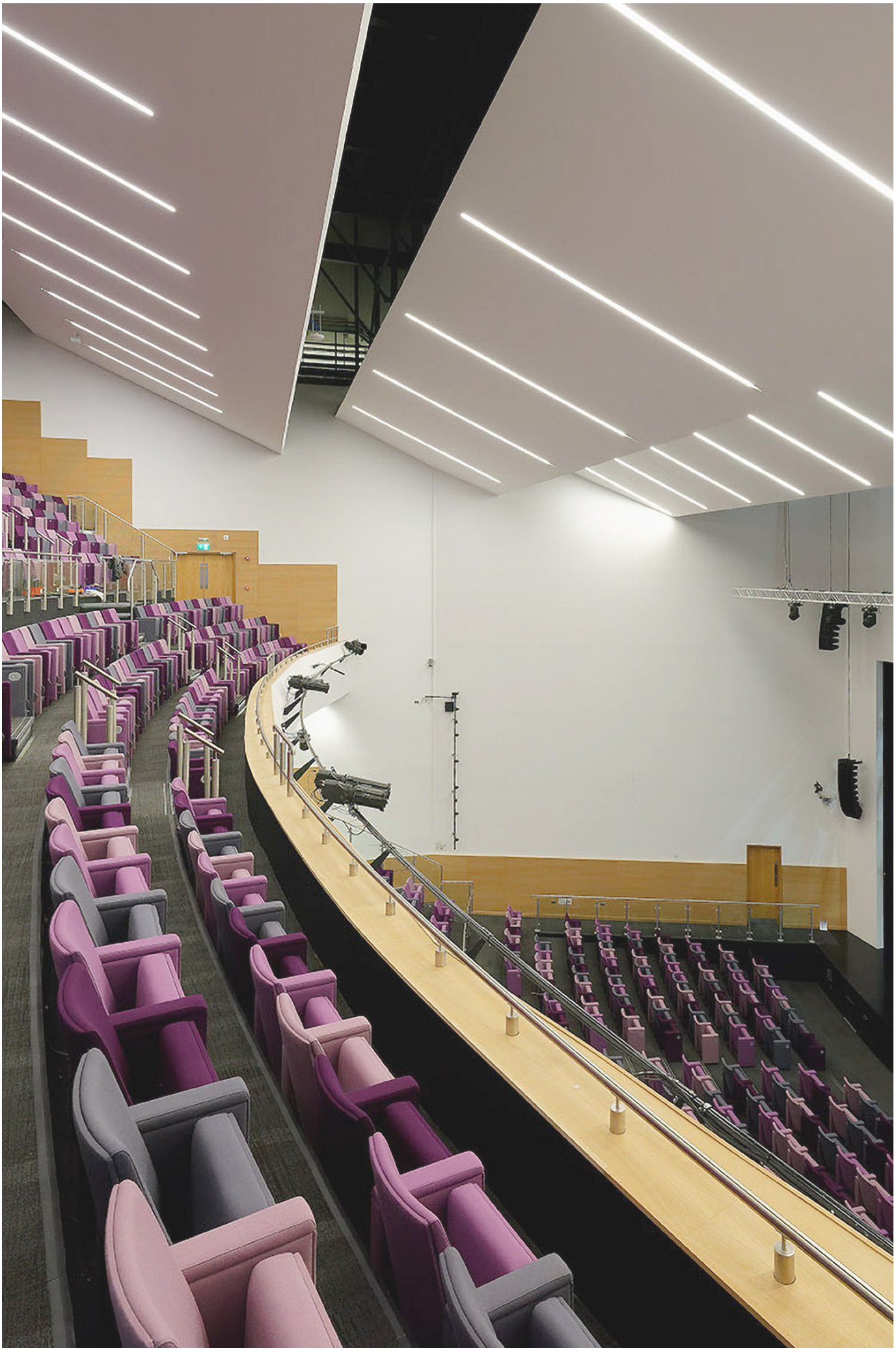
This guide, written by industry specialists, pulls together decades of experience from specification writers who almost instinctively know the questions on all aspects – from performance, material characteristics, sustainability and environmental to conformity marking, installation, maintenance and end of life.

There has never been a time in construction when the specification has been more important. This specification guide from FIS sets out our desire to help everyone involved in the specification of products and systems, and our commitment to improving the safety of residents, occupiers and those who use the built environment.

HELEN TAPPER, PRESIDENT, FIS

FIS is the trade body representing manufacturers, suppliers and installers in the fit-out sector, including drylining. The Drylining Working Group is an inclusive body with the following objectives:

- Develop technical standards as required
- Promote best practice in the market
- Educate and inform clients and specifiers about (working group) work
- Promote the products and skills of FIS members in this field
- Monitor and support risk on behalf of the community
- Shape the market so that the correct adherence to standards is recognised and adhered to by all, to the benefit of clients.



INTRODUCTION

The purpose of this publication is to highlight and guide you through some of the key criteria that should be considered when writing a specification for drylining, including partitions, wall linings and shaft wall.

Guidance is provided on the generic types of drylining, and the performance standards shown in BS 8000 Workmanship on construction sites – Part 8: Design and installation of drylining systems – Code of Practice and BS 8212 Code of practice for drylining and partitioning using gypsum plasterboard and the regulations that may apply.

A well written specification not only ensures the installation meets the client's requirements, but it also means the specifier's requirements are less open to interpretation, prices at tender stage are more accurate and performance needs are clear.

Note: it is in everyone's interest that an accurate and detailed specification is produced and reflects the GIRI principle of 'Getting It Right' first time to eliminate errors.

getitright.uk.com/resources

SCOPE

This guide has been produced to assist the selection and specification of drylining. Its aim is to help you select a system that will satisfy the performance needs and describe it in a structured way so that anyone reading it will understand it.

It is not a definitive list of standards, regulations or product types. Importantly, it is not a replacement for professional consultation on critical performance requirements or discussions with manufacturers on specific product use.

Drylining should be specified, procured, supervised, installed and maintained by people who are competent.

This guide is primarily aimed at:

- Architects
- Specifiers
- Interior designers
- Specialist installers
- Complementary trades
- Those who have or are about to have drylining installed.

"A well written specification not only ensures the installation meets the client's requirements, but it also means the specifier's requirements are less open to interpretation..."

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RIBA PLAN OF WORK

The RIBA Plan of Work is a document that outlines all stages in the planning, design and building process, from conception to completion on site. It is the most common document used in the UK to describe the stages in construction projects. The plan is often used by architects, yet it may not be easily digestible for all clients.

RIBA
Plan of Work

Under each stage you will find listed a number of issues that should be considered when specifying drylining. This, together with the checklist in the appendix, will help with ensuring that the right questions are being addressed at the right stage of the project.

architecture.com/knowledge-and-resources/resources-landing-page/riba-plan-of-work

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THE SPECIFICATION

WHAT IS A SPECIFICATION?

A specification is a detailed description of the performance requirements, dimensions, construction, workmanship, materials etc. of work done or to be done on a project, prepared by an architect, designer, engineer or manufacturer's specialist specification manager, often referred to as specifiers.

Note: specifications can be either prescriptive, where manufacturers are named, or performance, where the performance parameters are listed. So-called indicative specifications are considered less detailed and may refer to information contained in other strategy documents – this may lead to confusion and risk and, although they may be used as part of a development process, detailed specifications should be fully developed before tender.

TOP TIPS ON SPECIFYING DRYLINING

On your next project, do not be tempted to cut and paste from the last project, but take a fresh look and see for yourself the benefits of following this simple guidance.

These are the key points that we think will help you write a smart specification:

1 TALK TO THE MANUFACTURER

Manufacturers and system suppliers have the expertise, competence and relevant test evidence to interpret your designs and find the most cost-effective solution to meet all aspects of the brief. They can also help develop solutions to meet specific requirements.

2 PERFORMANCE IS KING

Performance is probably the most important aspect of a specification (fire resistance and reaction to fire, sound insulation, mechanical/structural robustness, moisture resistance and thermal performance). Performance is key to getting a smart specification. A product may look great and be under budget, yet it will be useless if it can't perform in the way you want.

Note: additional performance requirements may be stipulated by the employer, as well as insurance requirements.

Performance should be maintained as part of the 'golden thread', particularly when considering product substitutions.

architecturaltechnology.com/resource/definition-of-golden-thread-approved-by-uk-government.html

It is important that you convey the performance requirement unambiguously, stating the standard to which the product should have been tested, and specifying systems rather than individual products that may not have been tested together.

Note: Building Regulations Approved Document B states that people who are responsible for building work (eg agent, designer, builder or installer) must ensure that the work complies with all applicable requirements of the Building Regulations.

3 CONSIDER THE INTERFACE WITH OTHER ELEMENTS AND JUNCTIONS

It has been said that the edge is the most important element of a construction project, which means interaction and interface are crucial if performance is to be maintained, as well as tolerances between abutting elements.

4 UNDERSTAND THE USE OF THE SPACE NOW AND IN THE FUTURE

Operational and working practices are changing rapidly to accommodate a new, more agile workforce, so a flexible approach may be required to layout and service positions, which should be considered during the specification.

5 UNDERSTAND THE BUDGET

Budgets will vary greatly from project to project depending on the performance levels required on the installation in question. Specifiers can make their budget work harder for them by speaking to manufacturers and specialist contractors and suppliers, who should be able to suggest where cost savings can be made without compromising the result.

6 UNDERSTAND THE PROGRAMME, SERVICE PENETRATIONS, FIXING RESTRICTIONS AND SITE CONDITIONS

Although careful planning and budgeting can account for most things, the selection and availability of the system and the site conditions during installation can impact the programme positively or hold up the completion of the project and have an impact on the final finishes.

7 UNDERSTAND THE VISION AND CLIENT ASPIRATION

Are the tolerances achievable and covered within current tolerance standards?

8 ENSURE THE PERFORMANCE AND WORKMANSHIP REQUIREMENTS AND STANDARDS ARE CLEARLY INCLUDED

Performance standards should not be mixed and should be clearly defined in the specification.

Specifying a product is only halfway there if you don't state the standard of workmanship and quality expected at handover, particularly where you are specifying finishes.

BS 8000-8 Design and workmanship of drylining provides details of workmanship and should be referred to within a specification series. We also always recommend asking for a benchmark against which the completed work can be measured.

9 UNDERSTAND THE IMPLICATIONS OF MAINTENANCE

A product in a high-traffic area will undoubtedly require a different maintenance regime to, say, a boardroom. Products that can meet the need with minimum maintenance and cost should be a first choice.

10 UNDERSTAND THE ENVIRONMENTAL IMPLICATIONS AND WHAT WILL HAPPEN AT END OF USE

Specification considerations may in some cases be steered by where the drylining will be installed – for example, drylining in a high-humidity environment will be different to conditions found in a classroom. There may also be a need to meet a good BREEAM or SKA Rating, which will have an impact on the initial specification process.

11 DO NOT BE SCARED OF SPECIFYING NEW PRODUCTS

That's how new products are developed.

Note: a specification should state 'any alternative must be equal AND approved' not 'similar/equal OR approved'.

WRITING A SPECIFICATION

In order to provide a clear and unambiguous statement of what is required, a full, structured and detailed specification should be produced by the designer/specifier, ideally with assistance from the manufacturer.

WHAT'S INCLUDED AND WHAT'S NOT INCLUDED IN A SPECIFICATION?

The website of the National Building Specification body NBS says this about specifications:

"Populated by the specifier, a specification document describes in words what cannot be visualised or explained on a drawing or model. This document can be incredibly wide-ranging – covering the establishment of the site, the type of contract to be used, the performance criteria of the asset, the quality of the systems and products, which standards are applicable and how they should be executed, and even the products to be used.

"Specifications do not include information on cost, product availability, quantity or drawn/visualised information, so need to be read in conjunction with documents detailing quantities, schedules and drawings. For this reason, if a product is unavailable and a substitution is required, the specification document should be adhered to when choosing an alternative."

thenbs.com/knowledge/construction-specifications-everything-you-need-to-know

TYPES AND ADVANTAGES OF WRITING A SPECIFICATION

The production of a full, structured specification should happen in tandem with design work – with ever greater levels of detail added as the design progresses.

Initially, an 'outline specification' serves as a reference guide for clients and for contractors looking to price the project.

Then, by defining what is expected in a 'performance specification', manufacturers are able to offer similar or more innovative solutions, as well as acting as a design brief for specialist subcontractors involved in the tender process.

The 'full specification' should provide a detailed description of the product and/or systems in relation to the specific project and include the performance levels required.

HOW SHOULD SPECIFICATIONS BE STRUCTURED?

The structuring of specifications will vary from project to project but should reflect the work packages on a particular project and any subcontracts. This structuring should make it easier for contractors to price a job and provide a more accurate tender.

The use of a standard classification system, such as Uniclass 2015, or CAWS (Common Arrangement of Work Sections) is encouraged as it should reduce the potential for confusion or ambiguity.

thenbs.com/our-tools/uniclass-2015

designingbuildings.co.uk/wiki/Common_Arrangement_of_Work_Sections

Leaving specifications until the last minute – when production information is being prepared – is not advised.

NATIONAL BUILDING SPECIFICATION (NBS)

NBS provides libraries of pre-written clauses, guidance on regulations/standards and manufacturer product information. To ensure consistency, these are all written by NBS's in-house team and cover virtually all aspects of building design.

They are accessed through the NBS subscription service and have been developed over a long period of time. Starting out as NBS Clauses, the basic versions have been updated and added to with NBS Chorus.

Each main clause is followed by a number of subclauses ** to refine the type of framing, fixings, board type and finishing etc.

NBS CAWS drylining clauses

K10 Gypsum board drylinings/partitions

K30 Panel partitions

See annex for a list of codes

NBS Chorus (Uniclass 2015)

Note: not all manufacturers and system suppliers are supported on the NBS website and specifiers should contact the manufacturer, supplier or system owner for specification support.

It is important that manufacturers are consulted on projects. This will help to ensure that what you write in your specification is what will be installed on site. Most will also be more than happy not only to help you write the specification but also to build in performance, regulatory and any other requirements that should be taken into account when pricing or installing the drylining system.

Although the manufacturer can draft a specification for consideration, the designer/specifier is ultimately responsible and accountable for ensuring the final specification is compliant and in line with the project requirements and Building Regulations.

INTERNAL WALL TYPES (IWT)/SYSTEMS (IWS)

Using wall types to differentiate the construction of walls in a specification allows a pattern book approach to scheduling. Performance should take priority when developing the types but not the finish which may lead to confusion on site and the risk of non-conforming walls being constructed.

IWT/IWS should be rationalised where possible to reduce the different plasterboard and components on site to reduce waste and risk of non-compliance in construction.

Manufacturers will be able to assist with this process.


DANSK
DEUTSCH
ESPAÑOL
FRANÇAIS

DESIGN CONSIDERATIONS

APPLICATION

Identify the achievable main characteristics that your drylining should provide.

Satisfy performance requirements for specific applications with important requirements such as:

- Health / clinical – MRI rooms (only non-ferrous products); anti-ligature ceilings (prevention of self-harm and suicide in hospitals and prisons); pathology (smooth ceilings that can be easily cleaned and disinfected); wards / streets (pleasant, quiet environments)
- Educational – making sure the environmental aspects and acoustics are fit for purpose
- Cinemas – requirement for mass barrier construction and acoustic control
- Clean rooms – strictly controlled environments using compatible products
- Sports hall – acoustics / ball impact
- Swimming pool – ensuring the installation components meet the need for corrosion resistance
- Thermal mass construction – ensuring airflow matches the M&E requirements
- Environmental accreditation schemes – ensuring the project meets the environmental and corporate social responsibility (CSR) standards of the client.

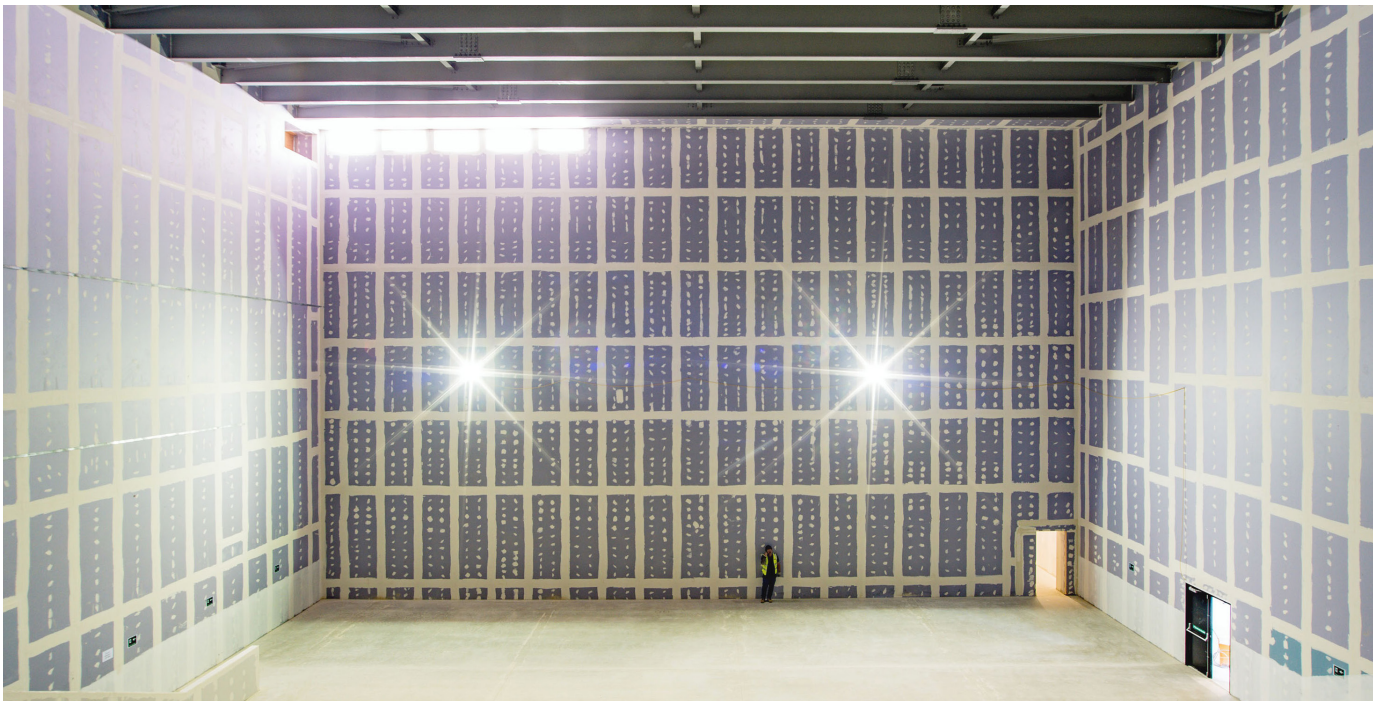
Wall/partition/ceiling interface – ensure that the design intent is clear at specification stage. Inclusion of manufacturer-approved standard details should be used where possible.

Where manufacturers' details do not cover project-specific interfaces, system suppliers should be consulted, and evidence of compliance approved before specification.

Any such interface details should be confirmed by the project's fire, acoustic or thermal consultants, to review and confirm the potential performance before specific junction details are approved by the principal designer before being issued.

Integration of services

- Particular attention should be made to scheduling the work, so that any builder's work holes are designed to comply and are installed before the services pass through them.
- Any services in or through the drylining may have an impact on the fire, acoustic, robustness and air tightness of the drylining and should be designed in collaboration with the M&E designers and the drylining manufacturers.



Drylining prepared for painting

DESIGN CONSIDERATIONS

MF bulkhead with applied enrichment

Aesthetics – any aesthetic changes to the drylining, such as shadow detailing to skirtings and door frames, should be designed in collaboration with the joinery and door suppliers, and the drylining manufacturers should be consulted to ensure that performance can be maintained.

Whichever selection is made, there will be a number of key performance criteria that should be met – some that need to be met to ensure the space is fit for its intended purpose and those that are desirable but not essential.

Note: under the Construction (Design and Management) Regulations (CDM), the designer is responsible for ensuring the installation can be delivered and is safe. A designer must take account of pre-construction information that the client or principal designer provides when making decisions about the extent to which they can eliminate foreseeable risks through the designs they produce. Where these risks cannot be eliminated, they should set out the steps they take to reduce or control them.

When designing, a designer must consider the risks to which people may be exposed through the course of constructing a building and when using it once completed.

Any services fixed to an MF ceiling or any drylining should be independently supported, or additional measures designed in collaboration with the system supplier, to ensure that the services are adequately and safely supported.

PERFORMANCE

This section outlines some of the performance characteristics that drylining systems can provide.

Note: links to Approved Document B refer to the English Building Regulations. Links to building regulations or standards for Scotland, Northern Ireland and Wales are in the Appendix on page 48.

FIRE

Fire performance includes 'reaction to fire' and 'fire resistance'.

To be valid, reaction to fire and fire resistance tests must be carried out by the national accreditation body UKAS* or a 'notified body'* test laboratory that is authorised to conduct and issue test reports in accordance with the specific test standards.

*EN tests to be carried out by a notified body in the EU or an approved body in the UK.

REACTION TO FIRE

Reaction to fire is a performance characteristic of the individual product itself related to the product's combustibility and behaviour in the early stages of a fire.

This attribute is a fundamental requirement of the harmonised manufacturing standard for plasterboard BS EN 520:2004+A1:2009 (EN 520) and is stated on a product's declaration of performance (DoP).

Note: this classification has replaced 'Class 0' from BS 476-6,7 which should not be used in specifications.

The Gypsum Products Development Association (GPDA) statement, Fire performance contribution of plasterboard manufactured in accordance with EN520 and used in system constructions/build-ups, provides more information on fire resistance and reaction to fire of plasterboard.

Reaction to fire is classified under BS EN 13501-1. Products are tested using a number of standards depending on the required or predicted performance.

Most paper-faced plasterboard products are able to fulfil the requirements of the standard to declare a default reaction to fire of A2 s1, d0, representing a very limited level of potential combustibility.

Fire reaction classifications

Classification	Definition	Contribution to fire
A1	Non-combustive	None
A2	Limited combustibility	Very limited
B	Combustible	Limited
C		Minor
D		Medium
E		High
F		Easily flammable
These are a simplification of the current and European standards for informative value only.		

The required reaction to fire classifications for materials used in commercial buildings is shown in Approved Document B.

assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/441669/BR_PDF_AD_B2_2013.pdf

B s1, d0

B
The main part of a classification is its letter: A1, A2, B, C, D, E or F. A1 represents the highest level of performance. F represents the lowest level of 'No performance determined'.

s1
There is a smoke classification of s1, s2 or s3. s1 represents the highest level of performance. s3 represents the lowest level of performance.

d0
There is a classification for flaming droplets and particles during the tests of d0 to d2. d0 represents the highest level of performance. d2 represents the lowest level of performance.

The classification system under BS EN 13501-1

PERFORMANCE

FIRE RESISTANCE

Fire resistance is a performance characteristic used to assess products used for fire compartmentation.

This performance is not a measure of individual products such as plasterboard, but of a system or build-up of which the plasterboard layer(s) form only a component part and the fire resistance performance is achieved by the combined system.

Where and how plasterboard is used, the method by which it is supported, fixed and finished, can all have a bearing on the apparent contribution of the plasterboard. For example, plasterboard fixed horizontally in ceilings is subject to different loads and heating conditions than plasterboard fixed in the vertical plane.

Fire-resistant systems could also include plasterboard encasements that can maintain fire protection to structural steel elements which are assessed under different criteria to typical separating elements.

Different manufacturers of plasterboard market a range of types of plasterboard. The relevant manufacturing standard EN 520 sets out minimum baseline criteria upon which different plasterboard products can be labelled to indicate their potential suitability to assist with varying end use performance requirements. This labelling is in the form of single letter 'type' notation such as type A, F, D, I etc. It is also possible for a plasterboard to combine numerous type notations to demonstrate a range of characteristics.

It is important to note that type notations cannot be treated as a direct indicator of either a plasterboard product's reaction to fire classification or its contribution to a system's overall fire resistance performance.

Note: some products and systems may be required to perform under load.

While the criteria for fire resistance tests are also very specific, there are many variables that can be included in the structural test construction, which can influence the test and installed performance. Variable items – height, type of structure and load, for example – will all affect the test result and performance when installed in the project.

The person specifying the system should examine the test report and satisfy themselves that the system meets performance requirements and can be constructed in accordance with the test report and field of application or classification report.

The specification should be explicit that the system is installed strictly in accordance with the system owner's instructions.

Where there are other elements that will perforate the drylining, such as services, the specifier should check that the fire performance of the drylining can be maintained using mitigation solutions, and that any evidence of performance is to the same standard as the drylining.

There should be no additional loads applied to the drylining.

The three requirements for BS EN tests are the ability of the whole construction to satisfy the loadbearing capacity (R), integrity (E) and insulation (I). When any one of those requirements is not met, the test is concluded.

The whole test is made up of a system constructed in an opening comprising components supplied from a single source typically made up of plasterboard fixed to a galvanised steel framework, with all joints filled with jointing tape and the screw heads and joints finished with a filler compound.

Note: not all systems require the joints between the boards to be finished.

Note: the specification should match the requirements in the test report.

The size of the opening will be determined by the test standard and the performance requirements.

As well as the final result, the test reports should show the overall construction, details of components used in construction, loading, data from the test and the test officer's observations during the test.

Drylining can also be tested under both BS EN and BS test standards as an element providing fire resistance.

The designer should specify the appropriate fire resistance testing standard from the list below, as variations can exist between standards and lead to confusion.

PERFORMANCE

- BS 476-20: Fire tests on building materials and structures - Method for determination of the fire resistance of elements of construction (general principles)
- BS 476-21: Fire tests on building materials and structures – Part 21: Methods for determination of the fire resistance of loadbearing elements of construction
- BS 476-22: Fire tests on building materials and structures – Part 22: Method for determination of the fire resistance of non-loadbearing elements of construction
- BS 476-23: Fire tests on building materials and structures – Part 23: Methods for determination of the contribution of components to the fire resistance of a structure
- BS EN 1363-1 Fire resistance tests. General requirements
- BS EN 1364-1 Fire resistance tests for non-loadbearing elements. Walls
- BS EN 1364-2 Fire resistance tests for non-loadbearing elements. Ceilings
- BS EN 1365-1 Fire resistance tests for loadbearing elements. Walls

FIRE TEST REPORT CHECKLIST

The following example points should be checked with the manufacturer:

- Opening size
- Maximum height (depending on fire test standard)
- Construction details
- Jointing and finishing
- Fixing centres
- Fixings
- Board orientation
- Board type
- Stud type and size
- Insulation and support method

ROBUSTNESS

The designer should select a system that has been tested and classified in accordance with BS 5234-2 to meet robustness and performance requirements.

Where a drylining wall system is used as infill, accommodation of imposed loads should be determined by the designers to comply with the requirements of the National Annex to BS EN 1991-1-1 and PD 6688-1-1 and included in the performance specification.

Where a drylining system is used as infill as guarding to prevent falls from height, it should conform with the requirements of BS 6180.

See over for an extract from BS 5234 Part 2: 1992 Partitions (including matching linings).

FIRE PROTECTION

Drylining can be used to provide fire protection to structural elements such as beams and columns.

The performance requirements are contained in BS EN 13381 series. Depending on what's being protected, the specifier should refer to the manufacturer's test evidence and guidance.

COMPARTMENTATION

Where compartmentation is required, the drylining must be capable of satisfying the insulation and integrity requirements of the Building Regulations for the stated period. To ensure adequate compartmentation, visible and concealed openings or cavities in raised floors, walls and ceilings, along with any service penetrations, must be protected to the required standard to ensure the construction meets the Building Regulations requirement.

Compartmentation is providing a level of performance that is critical to the safety of the building occupants and subdividing the building into areas of manageable risk.

Where compartmentation is required, ensure that a test report is provided showing the drylining system's suitability and, where the installation varies from the test, professional assessments are provided.

PERFORMANCE

Extract from BS 5234 Part 2: 1992 Partitions (including matching linings)

Grade	Category of duty	Examples
Light duty (LD)	Adjacent space only accessible to persons with high incentive to exercise care. Small chance of accident occurring or of misuse.	Domestic accommodation
Medium duty (MD)	Adjacent space moderately used primarily by persons with some incentive to exercise care. Some chance of accident occurring and of misuse.	Office accommodation
Heavy duty (HD)	Adjacent space frequently used by the public and others with little incentive to exercise care. Chances of accident occurring and of misuse.	Public circulation areas, industrial areas
Severe duty (SD)	Adjacent space intensively used by the public and others with little incentive to exercise care. Prone to vandalism and abnormally rough use.	Major circulation areas, heavy industrial areas

The interface of compartment walls should be designed in conjunction with the system's supplier to ensure the hierarchy of performance requirements is accounted for. The highest performing compartments should be considered first, and the higher performing wall takes precedence.

Where the fire wall is also being used to provide an acoustic performance, the requirements for fire performance must take priority.

FIRE PERFORMANCE LABELLING SCHEME

The labelling initiative aims to identify fire performance partitions to installers, M&E contractors, building owners and facilities managers, highlighting the risks of cutting service holes through partitions. Such holes negate the fire resistance performance of the partition, allowing smoke and fire to pass from one compartment to another. This could lead to loss of life and extensive damage to the building, as well as having a huge impact on the business.

Fire performance partitions identification and associated guidance can be found in Ss_25_10_30/230 Fire performance to BS EN 13501 or Ss_25_10_30/220 Fire performance to BS 476 which both have an item for fire performance partitions identification and associated guidance.

More information about the fire performance labelling scheme can be found at thefis.org/fire-label

CAVITY BARRIERS

Vertical or horizontal barriers should be installed to restrict the spread of smoke and flames through cavities. See Building Regulations Approved Document B assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/441669/BR_PDF_AD_B2_2013.pdf

FIRESTOPPING

Firestopping is the provision of seals to restrict the passage of fire and smoke through penetrations and fire-resistant elements. See Building Regulations Approved Document B assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/441669/BR_PDF_AD_B2_2013.pdf

The installation of service elements such as pipes, cables ducts and dampers through drylining without fire continuance measures of the same standard as the drylining can lead to a breach of the compartmentation line in a fire. If in doubt, speak to the manufacturer or a specialist consultant.

SERVICE OPENINGS

Where services penetrate any drylining, it will compromise the system's ability to perform (acoustics and fire performance). Therefore any penetration should be carefully planned and coordinated to ensure that the system's fire performance can be maintained and any implications on sound insulation can be mitigated where possible.

The size and position of any service openings should be considered during the design process in collaboration with the drylining manufacturer, M&E designer and firestopping supplier.

'The location of the services opening should avoid the door jamb studs, corner interface studs and any other critical stud locations, which are essential to the performance of the system.

Designers should consult with the drylining manufacturers to establish a compliant design – i.e lined or unlined service openings for services to pass through with plasterboard to ensure a compliant installation.

The scheduling of the work should be coordinated with the suppliers and specialist contractors to ensure the drylining can be installed safely, efficiently and compliantly.

Any builder's work holes should be installed in the drylining before the services pass through.

Compliance of the assembly will require the manufacturer of the firestopping to provide test evidence that the product will perform depending on the size of the opening, the services penetrating it and the construction detail of the opening being in accordance with the requirements for the project – ie shaftwall, integration of services, single or double boarded.

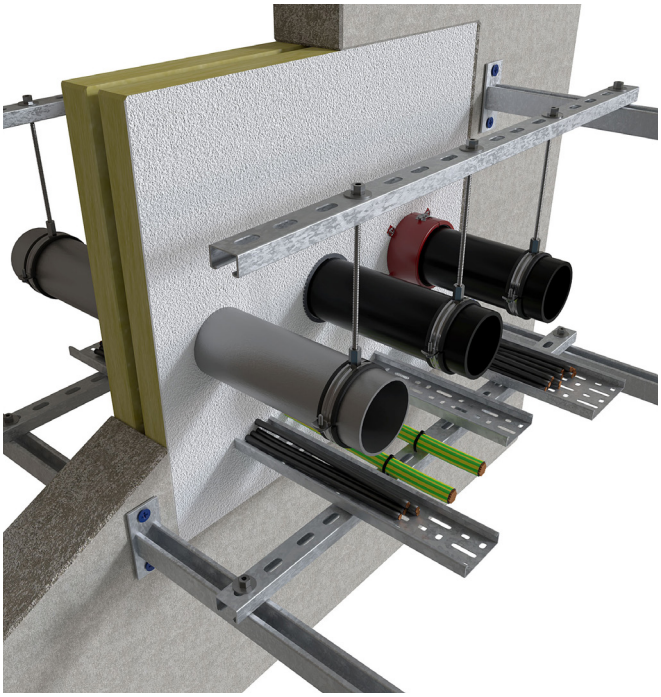
Detailed guidance can be found in the FIS guide:
FIRESTOPPING OF SERVICE PENETRATIONS – BEST PRACTICE IN DESIGN AND INSTALLATION
thefis.org/membership-hub/publications/best-practice-guides/firestopping-of-service-penetrations/

INTEGRATION OF SERVICES – PARTIAL PENETRATIONS

Non-loadbearing partitions are fire tested imperforate and therefore any hole cut into the face of the boarding either on one side or back-to-back would have a potential impact on the fire performance.

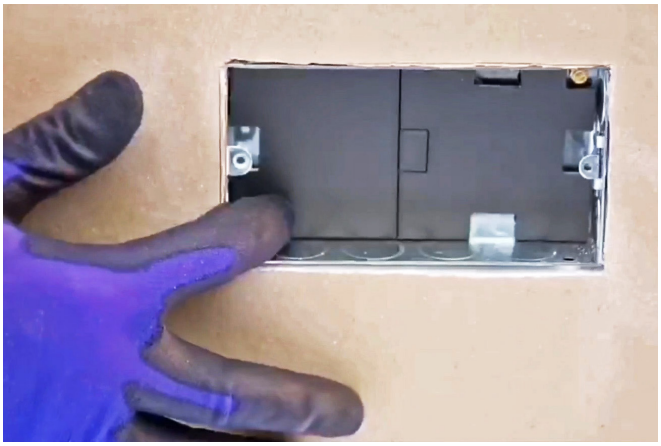
Unless there is specific fire test evidence to show that no additional firestopping is required, then this should be provided.

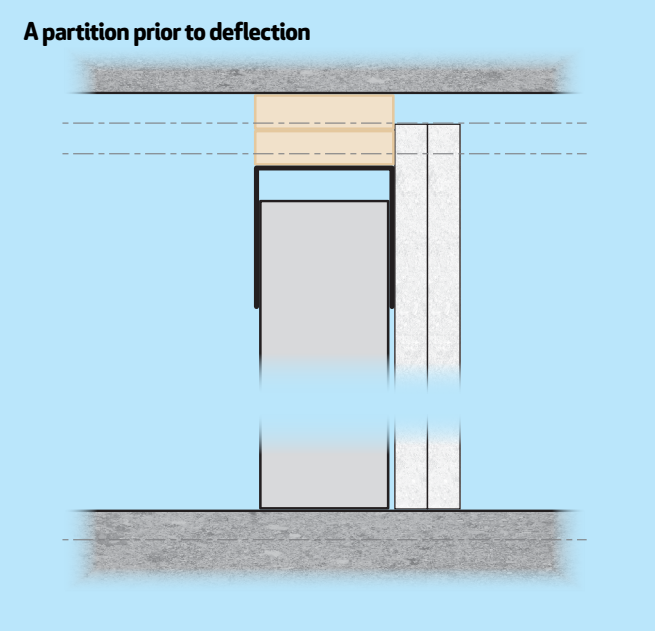
This could be putty pads (or variations), baffles, mineral wool or intumescent inserts.

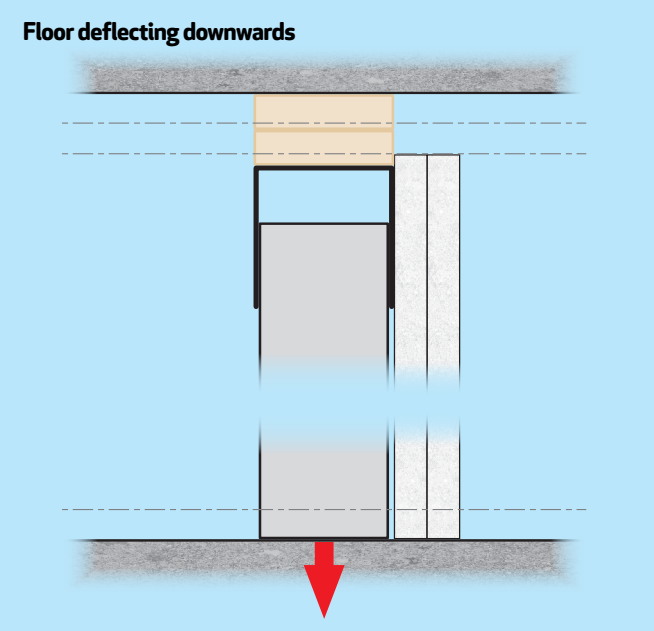


Service penetrations correctly sealed and supported through a fire wall

Partial penetration with intumescent lining







Typical deflection head operation - other types are available

MOVEMENT JOINTS

Movement joints should be designed in accordance with the system supplier's details, in accordance with BS 8212 and BS 8000-8 and to coordinate with building movement joints

DEFLECTION HEADS

Where partitioning will be installed below a slab that is designed to accommodate movement from live and dead loads, a deflection head should be specified.

Deflection heads can accommodate plus and minus movement, expressed as ± usually in units of 5mm.

Where fire performance is required, the specifier should check with manufacturers to provide evidence of compliance.

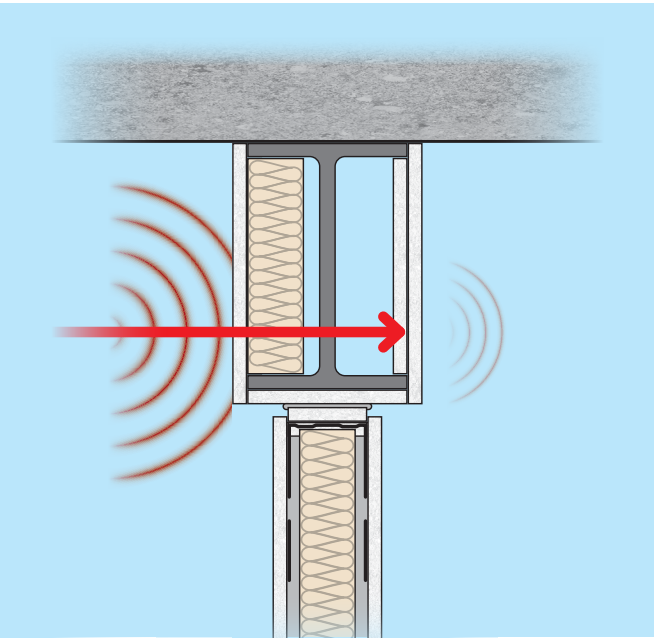
STRUCTURAL STEEL PENETRATING THE PARTITIONING

Where structural steel passes through a compartment wall, there are two important things to consider:

- Deflection
- Transference of heat through the steel, which may exceed the thermal insulation value of a compartment wall.

The interaction of the drylining, steel and fire protection of steel should be coordinated between all concerned on a job-by-job basis.

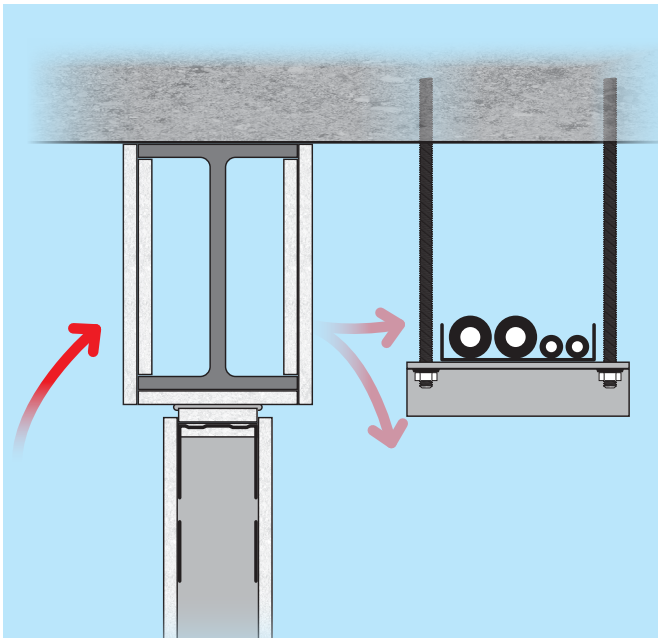
INSTALLATION OF DRYLINING TO THE UNDERSIDE OF STRUCTURAL BEAMS INCORPORATING REACTIVE COATINGS (INTUMESCENT PAINT)



Partition performance maintained

Partitioning is often installed along the line of a structural steel frame to provide fire compartmentation that includes insulation as well as integrity and/or sound insulation performance.

Fixing anything directly to either the column or beam treated with intumescent paint will impede the intumescent/reactive coating from expanding



180°C fire insulation maintained

and may allow heat to transfer to the steel.

This may result in localised loss of strength and potential failure in the event of a fire.

For more information on installing partitioning to the underside of structural steel sections coated with intumescent paint, see thefis.org/wp-content/uploads/2019/12/Installing-partitioning-to-the-underside-of-structural-beams-coated-with-Intumescent-paint.pdf

CREAKING IN TALL RESIDENTIAL TOWERS IN HIGH WINDS

In high-rise buildings, variable wind pressure/loading and vortex shedding can cause the whole structure to drift or sway, causing structural deformation. This can cause racking stresses to the non-loadbearing partitions and create noise sometimes known as creaking buildings.

FIS has published an industry awareness note availabe at thefis.org/wp-content/uploads/2019/12/Technical-Note-Creaking-in-Tall-Buildings.pdf

MAXIMUM HEIGHTS FOR FIRE WALLS

The maximum height at which a system can be specified for installation will depend on:

- Wall type
- Stud configuration
- Layers of plasterboard
- Performance – fire, acoustic, robustness, wind loading, any other loads (eg decorative stone).

Guidance on the limiting maximum heights drywall partitions and linings can be found at gpda.com/wp-content/uploads/2021/06/GPDA-Guidance-on-limiting-maximum-heights-drywall-partitions-and-linings.pdf

BS 476 – Under BS 476 there is no requirement to test above 3m – generally the fire test rig is 3x3m, and once a test is carried out and passes, then this meets one of the criteria.

The other criteria that the manufacturer needs to demonstrate is that the L/240 at 200Pa deflection criteria is achieved based on 'cold state' metal.

Both of the above would need to be demonstrated to confirm that it meets the BS 476 criteria.

EN 1364 – This is slightly more complicated. Again, generally the fire rigs are 3x3m, a fire test will be carried out, and if the mid-point deflection of the partition during the fire test is less that 100mm, then the direct field of application can be used. This allows the height to be extended by a further 1m.

If the height needs to be increased further, this will need an engineering judgement and should be carried out by an appropriate person such as accredited fire third-party UKAS-accredited body. They will refer to the 'extended field of application' (EXAP) in EN 15254-3 and then a classification report in accordance with EN 13501-2 should be issued. The accredited body would require the evidence from the actual test and the EI figures to demonstrate the partition stiffness. This process should be carried out at the beginning of the project if the requirement is to EN 1364.

Where test results have been provided from tests using BS 476, the Association for Specialist Fire Protection (ASFP) Advisory Note 17 and the Passive Fire Protection Federation (PFPF) technical assessment guide 3 should be used when designing.
data.asfp.org.uk/default.php?cmd=215&doc_id=6140
pfpf.associationhouse.org.uk/default.php?cmd=215&doc_id=6042

Note: fire resistance tests are for whole systems; substitution of materials specified within the system will make any performance claims null and void.

Note: there is no such thing as a fire rated plasterboard.

ACOUSTICS

A GUIDE TO OFFICE ACOUSTICS
thefis.org/membership-hub/publications/guide-office-acoustics/

SOUND INSULATION

Sound insulation is achieved by a reduction of the amount of sound energy that passes between two spaces separated by a dividing element.

Airborne sound insulation is achieved where spaces are separated with products containing mass as well as soft absorbing products, and installed so they are air tight to reduce flanking sound paths through gaps.

The sound insulation of a system such as a partition can be tested in a laboratory to produce a single figure rating reflecting the number of decibels by which sound reduces as it passes through the system. The figure will depend on the frequency of the sound in the source room, so measurements are generally taken across a range of frequencies between 50Hz and 5,000Hz and are taken at one third octaves.

Test results are then compared with a standardised reference curve to produce a weighted sound reduction index (R_w), where figures across a range of frequencies between 100Hz and 3,150Hz are used, in accordance with BS EN ISO 717-1.

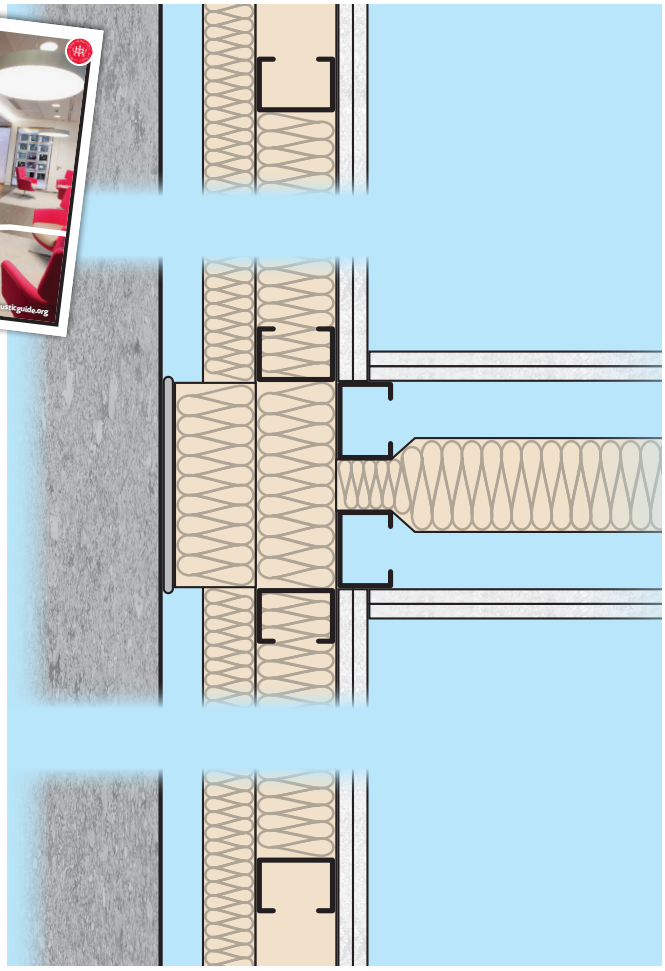
BUILDING ACOUSTICS

Building acoustics is the science of controlling noise in buildings, including minimising noise transmission from one space to another, and the control of noise levels and characteristics within a space.

Flanking transmission is the indirect transfer of sound energy around an element such as a partition wall, through service penetrations, doors, windows and the building structure.

The laboratory measurement of airborne sound insulation is based on the absence of flanking transmission.

To allow specifiers to compare the sound insulation performance of a ceiling, a single weighted R_w value is shown in the test report and in the manufacturer's literature.



Interface of partitioning to exterior wall system

Sound reduction index - a guide to sound insulation levels for speech privacy

Sound insulation between rooms R_w	Speech privacy
25dB	Normal speech can be overheard
30dB	Loud speech can be heard clearly
35dB	Loud speech can be distinguished under normal conditions
40dB	Loud speech can be heard but not distinguished
45dB	Loud speech can be heard faintly but not distinguished
>50dB	Loud speech can only be heard with great difficulty

PERFORMANCE

Note: as site conditions will vary, an acoustician should be consulted to interpret the laboratory results and advise on the anticipated on-site performance.

Note: any penetrations in the partitions for services will have an impact on the element's ability to perform and it may lead to significant loss of performance.

STRUCTURAL SOUND TRANSMISSION

Structural sound caused by footfall or machinery such as air conditioning units or lifts is primarily controlled by isolation and/or the absorption of vibration. Drylining and acoustic absorbers have minimal effect on its reduction.

ROOM ACOUSTICS

To ensure that the room acoustics are fit for purpose, the level of reverberation within the room should be controlled.

REVERBERATION

Acoustic problems and disturbance in a room are often derived from long reverberation times, which give a room an echoey feel.

The acoustic quality of a room can be expressed by measuring the reverberation time (**RT**) – the length of time it takes for reverberation to die down. If a room has a long reverberation time, one spoken word does not have time to die out before the next reaches the listener. With this overlapping of sound, speech intelligibility is poor. Generally, the shorter the reverberation time, the better the speech intelligibility.

The optimum reverberation time for a room or space is dependent on its intended use, be it office, conference room, classroom, cafeteria, cinema or library.

Measured in seconds, **RT** is defined as the time taken for a generated sound to decay by 60dB once the sound source has been stopped.

Measurement of the room's **RT** and any subsequent calculations will depend on the room's physical attributes – the dimensions and shape of the room, the construction and materials used for the interior surfaces, and the type and position of any other materials or objects used in the room.

Surface materials and objects with good, proven levels of sound absorption will reduce reverberation time.

As well as providing the right balance between reflection and absorption, the selection quantity and positioning of sound absorbing materials are key factors in achieving the correct **RT** for the room's intended use. Acoustic products in the ceiling and upper parts of the walls provide a more consistent level of absorption/reflection as they are free from obstructions such as desks, chairs and furniture.

For more guidance see the FIS
SPECIFIERS GUIDE - CEILINGS AND ACOUSTIC ABSORBERS
thefis.org/membership-hub/publications/specifiers-guides/ceilingsandacousticabsorbers/

"Any penetrations in the partitions for services will have an impact on the element's ability to perform and it may lead to significant loss of performance."

PERFORMANCE

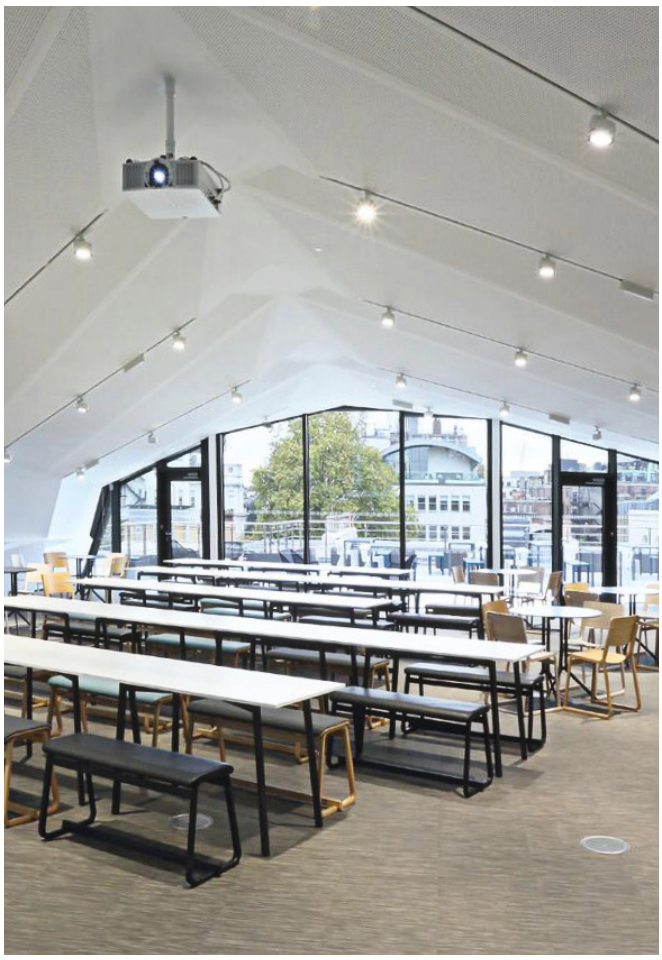
SOUND ABSORPTION

The sound absorbing properties of products are described in sound absorption classes A to E, class A being the highest level of sound absorption.

Materials are tested for their ability to absorb sound by being placed in a reverberation chamber and tested in accordance with EN ISO 354. The test is carried out over 18 separate frequencies, from 100Hz to 5,000Hz, and the results reported individually as sound absorption coefficients (**αs**) between 0.00 (total reflection) and 1.00 (total absorption).

The 'equivalent sound absorption area' (**A**) is the amount of a chosen product or object that would be required to equal $1m^2$ of a notional material (or open window) that has a sound absorption coefficient (**α**) of 1.00 (100% absorption) at all frequencies.

Note: as there is no single weighted figure for these results, the best comparison is to calculate the reverberation time for each room or consult an acoustician, who will compare products and calculate the quantity you require to achieve the optimum reverberation time in each room. They can also advise on the optimum positioning of the absorbers.



Perforated plasterboard on MF framework for acoustic absorption

INTELLIGIBILITY

It is important that speech can be understood, so in addition to working towards achieving a reverberation time, some additional acoustic engineering may be required by adding reflective and absorbent surfaces in strategic places.

Sound absorption classification

Class	A	B	C	D	E	Not classified
α_w value	0.90, 0.95, 1.00	0.80, 0.85	0.60, 0.65, 0.70, 0.75	0.30, 0.35, 0.40, 0.45, 0.50, 0.55	0.15, 0.20, 0.25	0.00, 0.05, 0.10

DESIGN FOR SECURITY

Where the drylining is forming the division between dwellings or forming the common parts in an apartment building, then the partitioning is required to meet Approved Document Q in England.

This can be met by ensuring the drylining meets the criteria in Secured by Design for walling systems. securedbydesign.com/member-companies/accredited-product-search?view=category&category=Walling+Systems

ELECTRICAL SAFETY

Poor electrical installations can pose a risk of electrocution or serious fire.

Although aimed at the domestic market, this publication provides an overview of areas of risks in many construction projects: electricalsafetyfirst.org.uk/media/1199/best-practice-guide-5-issue-2.pdf

OTHER MATERIAL CHARACTERISTICS

VOLATILE ORGANIC COMPOUNDS (VOCs)

Products that release very low levels of formaldehyde are required to achieve credits in most environmental schemes. The current method of assessing formaldehyde content in ceilings is described in BS EN 13964 and is based on EN 717-1, which has two classifications: E1 release ≤0.124mg/m^3 and E2 release >0.124mg/m^3.

Note: some plaster and plasterboard products and gypsum fibre board products are designed to absorb VOCs.

CORROSION RESISTANCE

It is important to identify any environmental conditions, such as high humidity in leisure facilities or exposure to sea air in canopies, to ensure that the materials specified are robust in these conditions.

A dew point/condensation study should be produced during the design stage, where different temperature or humidity levels will exist, to establish where further mitigating measures are required.

During the design process the specifier should consider any environment within the project scope that may cause the corrosion of metal components and systems. Examples of this are swimming pools, commercial kitchens and laundries.

BS EN ISO:12944 provides more guidance and outlines the range of environments, both internal and external, that can lead to the corrosion of steel components. The corrosive categories range from C1 (very low) to C5 (very high).

As an example, an indoor swimming pool has a rating of C4. The specifier should then seek guidance from relevant manufacturers to ensure the components are adequately protected to meet the demands of the location/scenario.

It is also recommended that the designer engages with a corrosion specialist at an early stage to review which elements of the design need protecting, to what degree and for what length of time.

Extract from BSEN 12944

Corrosivity category	Low carbon steel thickness loss µm	Examples of typical environments (informative only)	
		Exterior	Interior
C1 very low	≤1.3	–	Heated buildings with clean atmospheres eg offices, shops, schools, hotels
C2 low	>1.3 to 25	Atmospheres with low levels of pollution; mostly rural areas	Unheated buildings where condensations can occur eg depots, sports halls
C3 medium	>25 to 50	Urban and industrial atmospheres, moderate sulphur dioxide pollution; coastal area with low salinity	Production rooms with high humidity and some air pollution eg food-processing plants, laundries, breweries, dairies
C4 high	>50 to 80	Industrial areas and coastal areas with moderate salinity	Chemical plants, swimming pools, coastal ship and boatyards
C5 very high	>80 to 200	Industrial areas with high humidy and aggressive atmosphere, and coastal areas with high salinity	Buildings or areas with almost permanent condensation and high pollution
CX extreme	>200 to 700	Offshore areas with high salinity, and industrial areas with extreme humidity and aggressive atmosphere, and sub-tropical and tropical atmospheres	Industrial areas with extreme humidity and aggressive atmosphere

OTHER MATERIAL CHARACTERISTICS

This includes items such as fixings, metal studs and drylining components.

Extreme environments require specialist stainless steels. Advice should be sought.

Note: in semi and enclosed ceiling voids, chloride attack can seriously damage even C4 stainless steels.

STRENGTH AND ROBUSTNESS

Testing is carried out as part of BS 5234 Partitions (including matching linings). Specification for performance requirements for strength and robustness including methods of test, which includes:

- Partition grade testing
- Partition stiffness
- Hard body impact testing
- Soft body impact testing
- Door slamming

And options for:

- Crowd pressure
- Heavyweight anchorages
- Lightweight anchorages
- Pressure testing (UDL)
- Racking resistance.

The results of the test provide a duty rating.

AIR PERMEABILITY

The ability of a product or system to resist the passage of air can be a requirement between apartments, operating theatres, clean rooms and laboratories, where rooms may require a positive or negative room pressure. It is also important where airborne sound insulation is required.

WIND LOADING/AIR TIGHTNESS

Air pressure variations can be caused by the normal opening and closing of doors and windows, so the move to airtight buildings may increase the pressure exerted on ceilings and walls. It is important to identify if the risk could occur and, if so, to what extent.

Where dominant opening occurs – for example, in warehouses – specific advice should be sought from structural engineers and the manufacturers to ensure that the system will still meet the specified performance.

Note: wind load/pressure differential data will be required to provide a specification to meet the requirements.

RESISTANCE TO BACTERIAL/ FUNGAL GROWTH HYGIENE

Clinical, laboratory and food preparation areas will have specific requirements to resist bacterial and fungal growth, which should be considered at the specification stage.

Explanation of category duties

Grade	Category of duty	Examples
Light duty	Adjacent space only accessible to persons with high incentive to exercise care. Small chance of accident occuring or of misuse.	Domestic accommodation
Medium duty	Adjacent space moderately used primarily by persons with some incentive to exercise care. Some chance of accident occurring and of misuse.	Office accommodation
Heavy duty	Adjacent space frequently used by the public and others with little incentive to exercise care chances accident occurring and misuse.	Public circulation areas Industrial areas
Severe duty	Adjacent space intensively used by the public and others with little incentive to exercise a care. Prone to vandalism and abnormally rough use.	Major circulation areas Heavy industrial areas

OTHER MATERIAL CHARACTERISTICS

SUSTAINABILITY

The carbon footprint of drylining should be measured using a third party verified environmental product declaration (EPD) in accordance with ISO14025 and EN15804. An EPD is a nutritional label for a product that presents quantified environmental impact on the life cycle of a product.
designingbuildings.co.uk/wiki/Environmental_product_declaration

The means to reduce the environmental impact of drylining should be considered across the life cycle of the product from cradle to grave and include, for example:

- During manufacturing: increasing the recycled content of the product or using renewable energy.
- Transport to site: use of locally available materials, optimisation of lorry loads.
- Installation on site: use and disposal of packaging; offcuts produced on site during the installation process.

Considerations for the reduction of installation waste might include the segregation of offcuts to avoid contamination and recycling of offcuts by the manufacturers via, for example, take back schemes at the end of life of the product.

Schemes such as BREEAM and Ska are often drivers for the industry to request information from the manufacturers and contractors. Those schemes provide a framework for the evaluation of the environmental impact of a project: new construction, refurbishment or fit-out.

SKA rating helps landlords and tenants assess fit-out projects against a set of sustainability good practice criteria. It is estimated that 11% of UK construction spending is on fit-outs and that buildings may have 30-40 fit-outs during their lifecycle.
rics.org/uk/about-rics/responsible-business/ska-rating/

Project teams interested in fitting out spaces in an environmentally sustainable way can use the SKA rating method to:

- Carry out an informal self-assessment of the environmental performance of the fit-out.
- Commission a quality-assured assessment and certificate from an RICS-accredited SKA assessor.
- Obtain clear guidance on good practice in fit-out and how to implement it.
- Benchmark the performance of fit-outs against each other and the rest of the industry.

The relevant sections of BREEAM fit-out can be found at breeam.com/discover/technical-standards/refurbishment-and-fit-out

These include for contractors:

- Man 01: Project brief and design. The aim is to recognise and encourage an integrated design process that optimises building performance.
- Man 03: Responsible construction practices. The aim is to recognise and encourage construction sites which are managed in an environmentally and socially considerate, responsible and accountable manner. This includes:
  - Pre-requisite – all timber and timber-based products used on the project is legally harvested and traded timber
  - The principal contractor operates and environmental management system, eg: is ISO14001 accredited?

And, for suppliers:

- Mat 01: environmental impact of materials. The aim is to reward projects where materials have been selected to reduce their life cycle environmental impacts through the use of robust life cycle environmental assessment tools and robust environmental data. This means:
  - Need to carry out an LCA for the project
  - Use of products with EPD
- Mat 03: Responsible sourcing of materials. The aim is to recognise and encourage the specification and procurement of responsibly sourced materials for key materials used in refurbishment and fit-out. This means encouraging the use of materials that are responsibly sourced (and for all timber and timber-based products used on the project to be legally harvested and traded timber).

The Gypsum Products Development Association (GPDA) provide helpful advice on all aspects of sustainability when using gypsum products. Find out more here gpda.com/sustainability/

OTHER MATERIAL CHARACTERISTICS

CONFORMITY MARKS

The UK has adopted current (2021) harmonised European norms as designated standards, requiring products placed on the market in England, Scotland and Wales to have a declaration of performance produced by a designated body in the UK. A UKCA mark should be affixed where the product is put on the market in England, Wales and Scotland and a UKNI mark affixed when manufactured in the UK but put on the market in Northern Ireland.

gov.uk/guidance/using-the-ukca-marking
gov.uk/guidance/using-the-ukni-marking

CE MARKING FOR PRODUCTS PLACED ON THE MARKET IN THE EU, OR PRODUCED IN THE EU AND PUT ON THE MARKET IN NORTHERN IRELAND.

Where a harmonised standard exists for a product, the Construction Products Regulation (CPR) places obligations on manufacturers, distributors and importers (known collectively as economic operators) of that product when it is placed on the market. The product must have a declaration of performance and have been affixed with CE marking.

In compliance with the Construction Product Regulation (CPR 305/2011), ceiling systems are CE marked according to the European harmonised standard EN 13964:2014.

The standard consolidates methods for product testing, product classification and performance declaration for suspended ceilings.

To improve transparency in terms of product performance, CE-marked construction products are covered by a Declaration of Performance (DOP) to enable customers and users to easily compare the performance of products available on the European market.

MATERIALS

GYPSUM PLASTERBOARD

Plasterboard is manufactured in accordance with BS EN 520:2004+A1:2009 Gypsum plasterboard. This specifies the characteristics and performance of gypsum plasterboard intended to be used in building construction works and covers the following product performance characteristics: reaction to fire, water vapour permeability, flexural strength (breaking load), impact resistance and thermal resistance.

Gypsum plasterboard is manufactured from a gypsum core encased in and bonded to paper liners. Gypsum is obtained from a number of sources: mining in quarries; manufactured using DSG (desulphogypsum), a by-product of flue gas desulphurisation from coal-fired power stations; and recycled from old gypsum products.

Plasterboard can have a high recycled content and is a recyclable, sustainable product.

Boards are available with both tapered edges and square edges, and thickness ranging from 6mm to 25mm. Lengths vary from 1.2m to 3.6m and widths of 600mm, 900mm and 1,200mm are available.

In some Scandinavian countries, 900mm wide boards are used for partitions, and there is evidence that some contractors in the UK are adopting 900mm wide boards to reduce the risk of musculoskeletal injury.

Specifiers should ensure that relevant systems have been tested to ensure that performance can be maintained and that manufacturer recommendations for setting out and stud centres are adhered to.

Specialist gypsum-based boards may be suitable for use in areas exposed to temporary humidity, such as bathrooms and kitchens. However, in wet areas such as showers, the exposed surfaces of the boards must be protected against water and moisture. Standard plasterboard is not recommended in any regularly moist or humid areas and consideration should be given to using moisture-resistant board in these areas.

SUBCATEGORIES OF BOARD MAKE-UP

Within the main gypsum-based board types above there are various subcategories of boards. These can include boards with:

- Vapour control layer on the back
- Greater impact resistance
- Greater density for higher acoustic performance
- Moisture-resistant properties
- Thermal insulation attached
- Perforations for sound absorption
- Other specialist treatments
- X-ray resistance.

Glass-reinforced gypsum plasterboard

These boards are manufactured in a similar way to gypsum plasterboard, with the addition of glass wool-facing membranes and/or glass reinforcement. They provide greater fire resistance to standard gypsum plasterboard.

Calcium silicate boards

Calcium silicate boards are manufactured from a mix of lime, cement, silica and fire-protective fillers in combination with cellulose fibre.

Cellulose-reinforced cement boards

Cement-based boards are made from a mixture of cement and binders or reinforcing materials such as engineered wood filaments.

Glass fibre-reinforced cementitious boards

Cementitious boards are manufactured from Portland cement, lightweight fillers and binders. The boards may also contain alkali-resistant fibre in the form of mesh or random strands.

Gypsum fibre board

Gypsum fibre boards are manufactured from gypsum and cellulose fibres produced from recycled paper, mixed with water but without the use of binders.

Specialist cut boards

Fabrication companies are able to provide boards cut to form specific profiles either for assembly on site or provided as a flat pack for site assembly. The process of cutting only removes specific sections of the gypsum, such as a mitre, but retains the paper face. This eliminates the need for metal or paper angles, ensuring a crisp edge to the works. These are generally acceptable for areas requiring a more aesthetic appearance and may not be suitable for fire or acoustic performances unless specifically tested.

MATERIALS

GENERAL

The performance characteristics of the types of gypsum plasterboard defined here may be combined in one board, in which case the letter identifying each type of performance satisfied shall be given in the designation.

Types of gypsum plasterboard as defined in BS EN 520:2004+A1:2009:

Type A

Plasterboard with a face to which suitable gypsum plasters or decoration may be applied.

Type H

Plasterboard with additives to reduce the water absorption rate. They may be suitable for special applications in which reduced water absorption properties are required to improve the performance of the board. For the purposes of identification, these boards are designated Type H1, H2 and H3, with different water absorption performance.

Type E (gypsum sheathing board)

Specifically made to be used as sheathing board in external walls. They are not intended to receive decoration. They are not designed to be permanently exposed to external weather conditions. This type of wallboard has reduced water absorption rate. They shall have a minimum water vapour permeability.

Type F (gypsum plasterboard with improved core adhesion at high temperature)

Plasterboard with a face to which suitable gypsum plasters or decoration may be applied. These boards have mineral fibres and/or other additives in the gypsum core to improve core cohesion at high temperatures.

Type D (gypsum plasterboard with controlled density)

These boards have a controlled density, with a face to which suitable gypsum plasters or decoration may be applied. This enables improved performance in certain applications to be obtained.

Type R (gypsum plasterboard with enhanced strength)

For special applications where higher strength is required, having both increased longitudinal and transverse breaking loads. They have a face suitable for gypsum plasters or decoration.

Type I (gypsum plasterboard with enhanced surface hardness)

Used for applications where higher surface hardness is required. They have a face to which suitable gypsum plasters or decoration may be applied.

Note: any gypsum-based plasterboard should not be used in environments consistently exceeding 49°C, such as a fire surround for log burners.

Note: all plasterboard requires a framework, fixings and jointing to be a system that has test evidence to demonstrate performance compliance.

Note: there are no performance criteria for the boards alone, and any performance requirements should be considered as part of a system.

STEEL FRAMES

Stud and track are formed from pre-galvanised mild steel to BS EN 10327 continuously hot dip coated steel flat products.

TIMBER FRAMES

Rows of timber studs are fixed to timber horizontal heads and sole plates.

Note: for guidance on tolerances, see the National Structural Timber Specification (NSTS) Version 2 [10], which covers installation tolerances in timber frame, SIPS and CLT.

Where timber studs, joists and CLT are considered, evidence of performance should be sought in the form of a test report or assessment in lieu of a report, but using test evidence, and any design must ensure that the components and minimum dimensions of the components used match those in the test evidence.

Where the timber will be used to provide loadbearing elements, evidence of compliance should be requested from the fire engineer.

Note: designers should not assume that manufacturers will warrant or guarantee these configurations.

DRYLINING SYSTEMS

Drylining is a method of lining walls and ceilings using gypsum-based boards fixed to a frame or directly fixed or adhered to a substrate. It is also used for constructing partitioning and fire walls using gypsum-based boards fixed to steel or timber frames between the structural floor and slab, to be prepared to receive decoration.

BS 8212 states: "Drylining is an alternative to the traditional wet plastering of walls and ceilings to provide surfaces suitable to receive various decorative treatments. The method involves the fixing of a sheet material, which is subsequently jointed in the appropriate manner, to the face of the walls or ceilings."

TYPES OF DRYLINING SYSTEMS

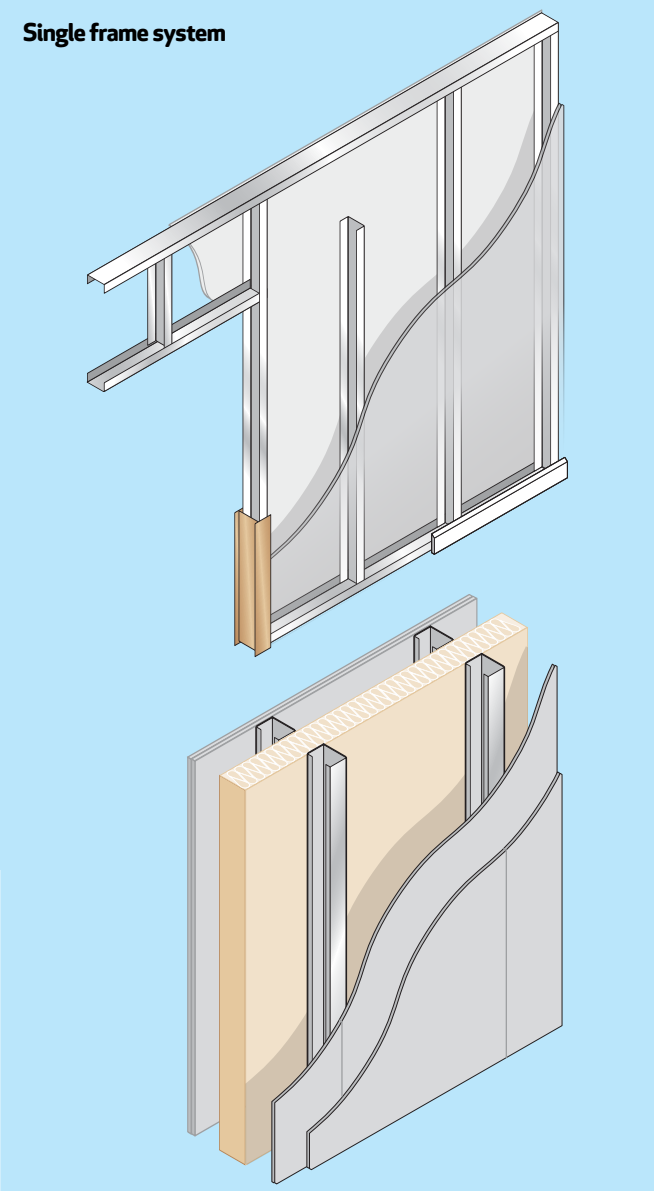
0.0.0.1 SINGLE FRAME

A 'C' stud or 'I' stud profile frame with one or multiple layers of plasterboard fixed to the frame to create a partition.

Single rows of metal studs should be positioned at the required centres in metal head and base channels.

Single rows of timber studs should be fixed to timber horizontal heads and sole plates.

Single or multiple layers of plasterboard should be attached to both sides of the studs with the option to install insulation within the cavity of the wall using the mechanical fixings, taped and sealed at joints, allowing for finishing.



TWIN FRAME

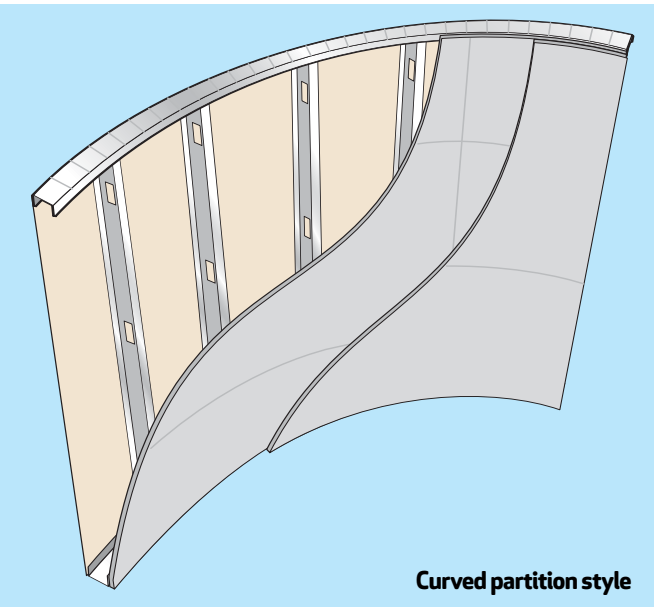
Double rows of metal studs should be positioned in metal head and base channels, which are braced or non-braced.

Double rows of timber studs should be fixed to timber horizontal head and sole plates, which are braced if required.

Single or multiple layers of plasterboard should be attached to the room sides of the studs with the option to install insulation within the wall cavity.

CURVED PARTITIONS

A curved partition/linings can be formed either using a single or double row of vertical studs at reduced centres between notched or specialist



head and base tracks. Metal frame partitions are installed between notched head and base channels, constructed to form a curve. Timber-framed curved partitions generally comprise templated plywood head and base channels. The key limitation to the achievable radius is the ability of the lining boards to accommodate the required curve.

Plasterboard should be fixed horizontally across as many studs as possible.

STAGGERED STUD SYSTEM

This comprises a double row of staggered studs slotted within a single head and base channel. This can reduce the overall partition width compared with a standard twin wall.

Staggered rows of studs should be positioned in single head and base channels using spacer clips.

Note: the installation of pattresses may require specialist detailing.

Note: addressing any flanking sound may require specialist detailing.

SHAFT WALL

Shaft wall is a single frame partition used to form partitions where there is no or limited access to one side of the partition.

Single rows of shaft wall metal studs should be positioned in a single head and base channel. A single layer of specialist plasterboard should be installed between the studs to the shaft side, using system components.

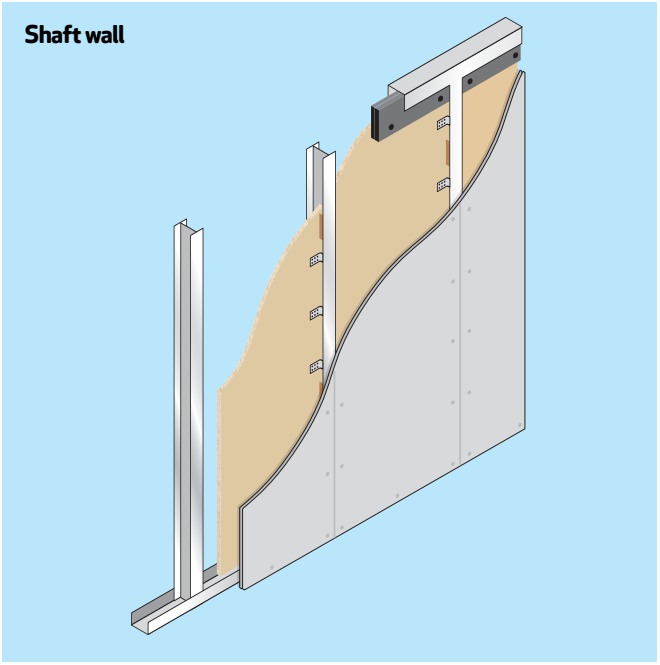
LININGS

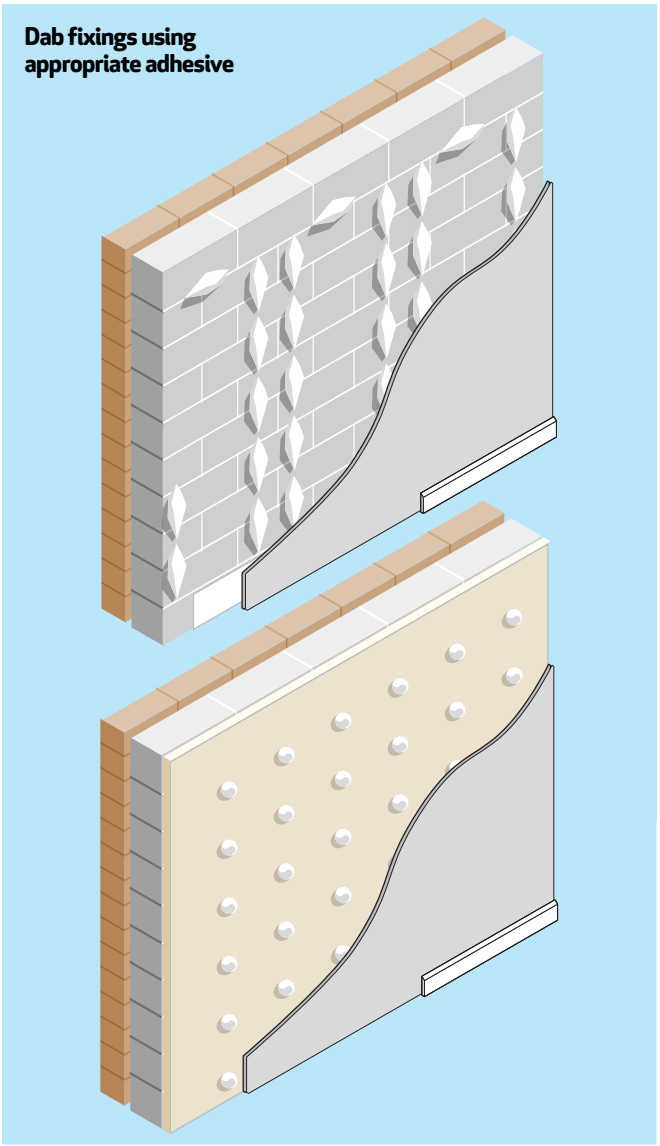
DIRECTLY BONDED DRYLINING TO SOLID BACKGROUNDS

Plasterboard directly bonded to solid backgrounds do not require metal framing and assist with maximising room space.

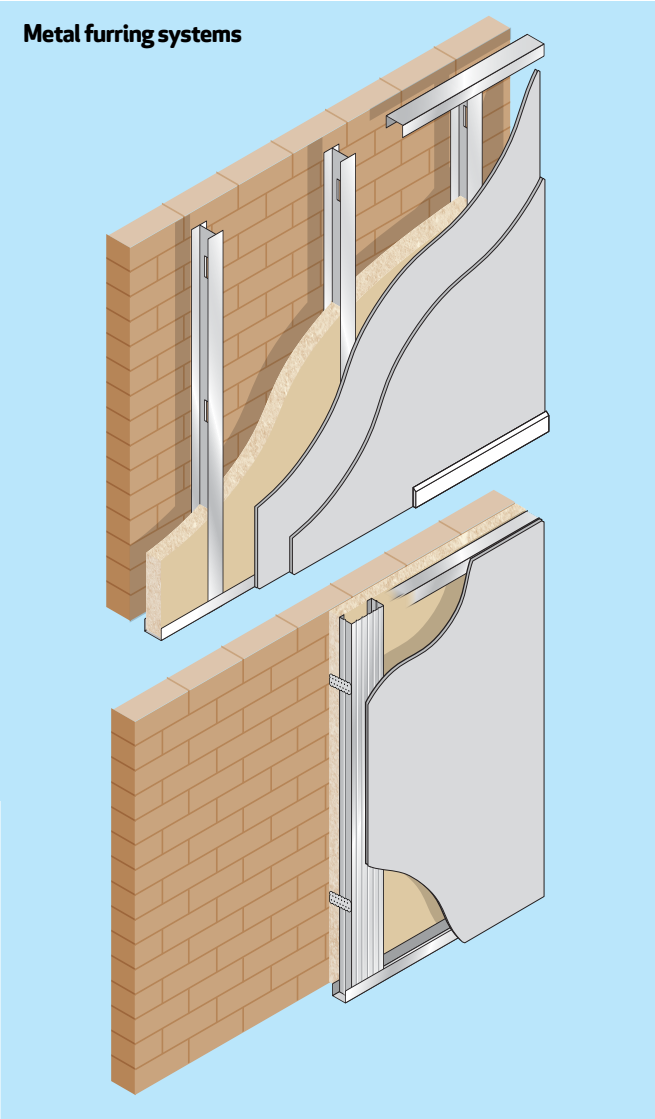
Single layers of plasterboard and thermal laminate board should be attached to dry, solid backgrounds using a system owner approved board adhesive. The thickness of the adhesive should allow for tolerances of the background.

Backgrounds should be structurally adequate to carry the weight of linings and their fixtures.





DRYLINING SYSTEMS


Metal furring systems

Where backgrounds are unstable or unsound, alternative lining systems should be used.

Note: these systems are suitable for single layer and single board heights only.

Note: this method of direct bonding is not suitable for vapour control boards, which should be installed directly to a metal framing.

Note: the absorption/suction/porosity of the background can impact the suitability for directly bonding boards and should be checked before specification.

METAL FURRING SYSTEMS (MF)

Metal furring is bonded to solid backgrounds. Plasterboard is then screwed to the metal furrings.

Metal furrings should be attached to dry, solid backgrounds using a system owner approved board adhesive. The thickness of the adhesive should allow for tolerances of the background.

Single layers of plasterboard and thermal laminate board should be attached to the metal furring using drywall screws. The length of drywall screws should be selected such that they do not come into contact with the background.

BACKGROUND SUPPORTED LINING SYSTEM

A background supported lining system comprises metal channels fixed back to the solid background using brackets. Plasterboard is then screwed to the metal channels. This system allows for deeper offsets to accommodate more pronounced irregularities in the background.

Vertical metal channels should slot into head and base channels and should be attached to the dry, solid background using the system owner's brackets.

Plasterboard or thermal laminate board should be attached to the metal channels using drywall screws.

Note: insulation can also be incorporated into the cavity.

INDEPENDENT LINING SYSTEM


Independent lining system with site protection prior to boarding

An independent lining system comprises a metal or timber frame with vertical studs. Independent lining systems are used where there is no suitable structural background to which the framework can be braced, or for performance reasons.

Rows of metal studs are positioned in metal head and base channels offset from the background.

Rows of timber studs are fixed to timber horizontal head and sole plates offset from the background.

Single or multiple layers of plasterboard are attached to the room side of the studs, with the option to install insulation within the cavity of the lining system.

Plasterboard or thermal laminate board are attached to the metal channels using drywall screws.

Note: insulation can also be incorporated into the cavity.

ENCASEMENT FOR STRUCTURAL STEEL FIRE PROTECTION

FRAMED

Frame encasement systems comprise plasterboard cladding on a metal frame.

Specialist steel framing clips should be fixed to structural 'I' beams and 'I' columns at designated centres to provide supporting background for channels.

Note: other methods of fixing to steel structures are available.

Note: where encasing RHS and SHS columns and beams, refer to the manufacturer's guidelines.

FRAMELESS ENCASEMENTS

Specialist board manufacturers have test evidence where boards are installed without the need for an internal frame and can provide fire (E I) and acoustic performance.

Note: where encasing RHS and SHS columns and beams, refer to the manufacturer's guidelines.

DIRECT APPLIED

A direct applied drylining comprises one or more layers of plasterboard, which could include thermal laminates, fixed directly to the structural substrate using suitable mechanical fixings.

Directly applied plasterboard systems should be installed perpendicular to the direction of joists. Manufacturers' recommendations for installation should be followed.

The system owner should be consulted where fire, acoustic, thermal and structural performance is required.

Note: common types of joists include solid and/or engineered joist/truss types.

Note: resilient bars can be introduced between the lining and the structure, sometimes referred to as a semi-direct system.

Noggins should be installed at ceiling perimeters in accordance with the system owner's requirements.

More information can be found in the ASFP Yellow Book data.asfp.org.uk/default.php?cmd=210&doc_category=119

FINISHING

JOINTING

Plasterboard joints can be finished by applying tape and jointing material between the taper edged plasterboard.

Note: BS 8000-8 Design and workmanship of drylining specifies the allowable crown and allowable deviations at corners and junctions.

Alternatively, a thin layer of plaster or spray-applied finishing can be applied to the jointed drylining to provide a smooth surface ready for final preparation before painting.

Known as a skim coat, it is applied in one application approximately 3mm thick. Because the application is so thin, there is no current standard on its finish.

Where there are no specifications on the project for the drylining and plastering, BS EN 13914-2 recommends that if the level of smoothness is not specified, Level 1 should be assumed.

Note: jointing methods may differ between systems; the methodology should be checked with the supplier before specification.

Finishing requirements

Level	Application
1	For use in areas where finish is not critical
2	To receive a textured wallpaper, wallcovering or paint
3	To receive a matt paint, smooth wallpaper or smooth wallcovering
4	To receive a semi-gloss paint and/or glancing illumination

A gypsum finish plaster specially formulated for increased resistance to accidental damage can be applied.

This can be up to 60% more hardwearing than standard plaster and provides resistance to glancing impacts or accidental damage such as scratching, gouging or chipping, which enables longer maintenance intervals.

INTERFACE WITH SFS

Where drylining forming compartmentation lines interfaces with light gauge steel external wall systems using steel framing systems (SFS), the design should ensure that the cavity behind the internal linings include measures to stop the passage of sound, fire and smoke and includes a thermal barrier.

More information can be found in the FIS/SCI **SPECIFIERS' GUIDE - LIGHT GAUGE STEEL FRAMING SYSTEMS (SFS) EXTERNAL WALL SYSTEMS**
thefis.org/membership-hub/publications/specifiers-guides/light-guage-external-wall-systems/

LOAD CAPACITY

Drylining systems are non-loadbearing (they are not designed to take an axial/structural load), but they can be designed to accommodate loads such as:

- Uniformly distributed load (UDL) – for example, a wind load
- Eccentric/ shear load – for example, shelves and cupboards or tiles or stone facing
- Crowd load, a force that may occur in escape corridors.

The ability to accommodate a load on a system will depend on its height, its layout, stud size and configuration, including noggins, board layers board types and inclusion of pattresses. In each case, they should be discussed on a project-by-project basis with the system suppliers and specialist pattress suppliers.

Evidence can be provided from tests such as BS 5234.

Note: the quality and type of the fixing should be specified to ensure there is compatibility between all components.

Although additional elements placed in or on the drylining system may not cause it to exceed the system UDL, it is important to establish whether the tiles, planks or infill units are able to support the load in their own right or if there is a need to provide additional support in the form of pattresses.

The manufacturer should be consulted to ensure that the anticipated design load can be accommodated.

Note: this could be split into two areas: Horizontal UDL to BS 6399-1: Part 1: 1996 (cited in Building regulations in England but withdrawn, now replaced by the national annex of EN 1991-1-1) for dead and imposed loads and partition stiffness, for which the methodology is based on BS 5234: Part 2 where a lateral deflection under a given uniformly distributed load UDL offers a criteria for the maximum lateral deflection of the partition which should not exceed L/240 where L is the partition height when the uniformly distributed load is 200Pa.

More information can be found in the Gypsum Products Development Association (GPDA) guidance on limiting maximum heights gpda.com/wp-content/uploads/2021/06/GPDA-Guidance-on-limiting-maximum-heights-drywall-partitions-and-linings.pdf

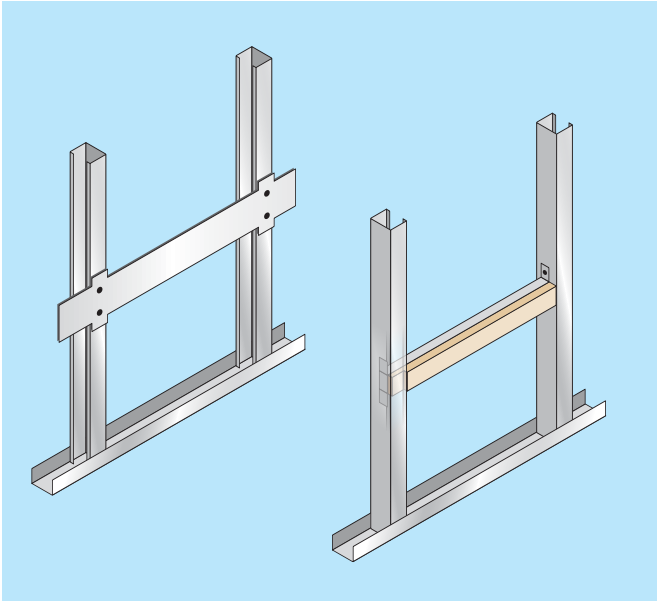
Accommodating load on the face of the partition, such as stone facings on corporate receptions, sanitary ware or shelving, should be designed in coordination with the system suppliers.

Some plasterboard manufacturers produce specialist boards which are designed to accommodate some loads depending on the substrate and the load.

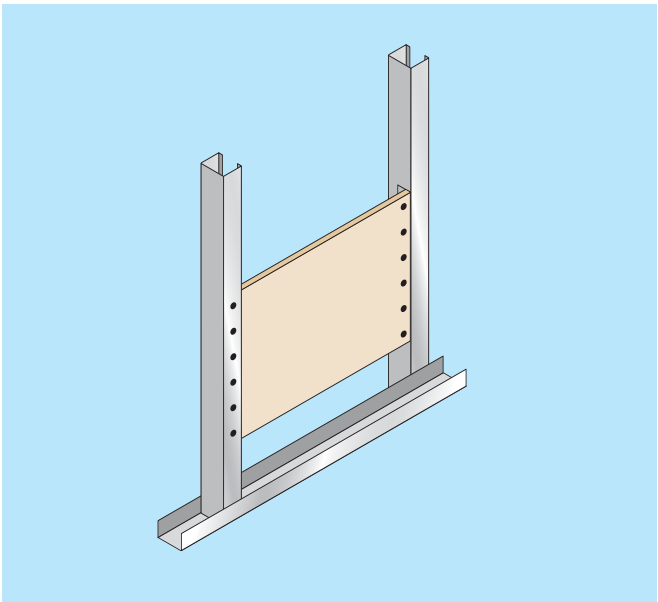
The maximum applied load from tiles, handrails, storage cupboards etc should be provided to the manufacturers at the specification stage to ensure that the system is able to accommodate the load and deflection from the load. This is particularly important where it may impact the performance of the partition (its robustness and fire resistance) and where sanitary ware may form part of the support for individuals in toilets – such as under Approved Document M in England (access to and use of buildings).

Where sanitary ware is installed directly to the face of the drylining, the fixings as well as the framework and any pattresses should be designed in collaboration with the drylining system supplier, pattress supplier, fixings supplier and sanitary ware supplier, using BS EN 1991 Eurocode 1: Actions on structures for dead and imposed loads and Partition stiffness, for which the methodology is based on BS 5234: Part 2.

Additional noggins and straps to provide background for surface mounted items



Internal pattress for heavier items



PATTRESS

Installation of pattressing

The selection of pattress materials and fixings and the method of installation are critical to accommodate the load, and meet the performance requirements of the system supplier, which may, for example require predrilling of the pattress material and should be coordinated between all parties.

All pattress materials should be conditioned on site before installation.

FSC /PEFC sourced timber may be required to meet sustainability requirements.

BS EN 13986:2004+A1:2015 Wood-based panels for use in construction. Characteristics, evaluation of conformity and marking provides guidance when selecting products.

mdfosb.com/en/products/smartply-pattress-plus

FIXINGS

The selection and installation of the correct fixings to the structure, and the fixings used to install the plasterboard on the framework, are critical to the compliant installation of the drylining to meet its performance.

In addition, as a specialist association, the Construction Fixings Association (CFA) has put together a number of 'how to' guides to help you understand the selection, installation and testing of fixings based on BS 8539 – Code of practice for the selection and installation of post-installed anchors in concrete and masonry. shop.bsigroup.com/ProductDetail/?pid=000000000030215640

Note: proof testing is not complicated and is important – it is the only safe way to find out if the selection and installation are correct for the project.

The Construction Fixings Association provides information about drilled-in fixings and anchors for concrete, masonry and plasterboard.

the-cfa.co.uk

More information can be found in the **FIS BEST PRACTICE GUIDE: SELECTION AND INSTALLATION OF TOP FIXINGS FOR SUSPENDED CEILINGS**

thefis.org/membership-hub/publications/best-practice-guides/

DRYWALL SCREWS

Note: drylining screws used to support plasterboard to the framework should be as specified and supplied by the manufacturer to maintain any guarantees and warranties.

The fixing into the structure should be specified by the designer to ensure they are suitable for the substrate, the load the environmental conditions and fire performance.

CIRIA (Construction Industry Research and Information Association) has produced guidance on construction fixings in its publication General fixings – selection and whole-life management (C777). This includes a fixings rating system based on the consequences of failure, called RAG.

ciria.org/Events/Post_event_information2/2019/Fixings_-_General_and_Safety_-_critical.aspx?WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91

FINISHING

RAG stands for:	
RED	Critical fixing
AMBER	Less critical
GREEN	Important but not critical

SER Scotland – Structural Engineers Registration has been appointed by the Scottish Government's Building Standards Division to administer a scheme for the certification of design of building structures.
ser-ltd.com/ser-scotland/resources/certification-performance-criteria/b6-1-internal-partitions-and-ceilings

SER Jersey – has been appointed by the Government of Jersey Planning and Environmental Department to administer a scheme for the certification of design of building structures.
ser-ltd.com/ser-jersey/resources/procedures-and-planning/b6-1-internal-partitions-and-ceilings

DOORS

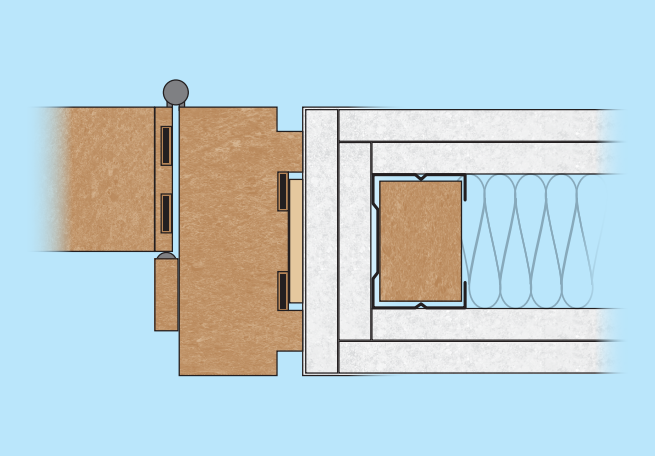
DOOR NIBS

Where doors are required to abut a run of partitioning, the specifier should check the minimum size of nib required to accommodate the weight of the door.

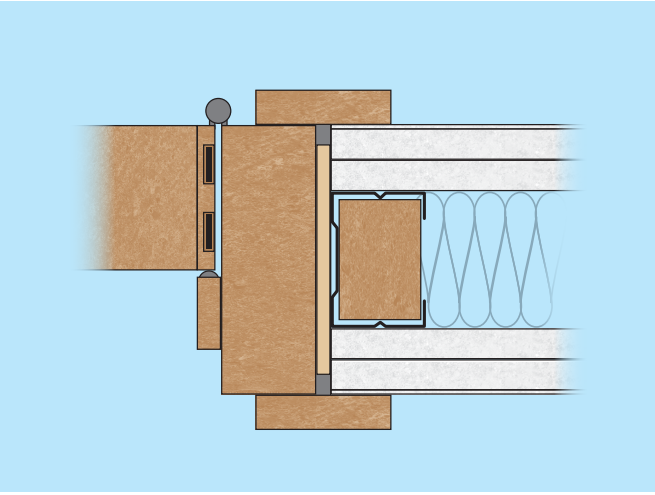
FIRE DOORS

Where supporting walls are drylining, they may be described as flexible walls.

Fire doors are an important consideration in the specification process, and specifiers should look for evidence that the door sets/assemblies have been tested in a drylining system (flexible wall). The door sets should have test evidence using BS EN 1634 – Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware. Fire resistance test for door and shutter assemblies and openable windows.



Lined and unlined opening for door frames



Due to the significant number of flexible wall solutions offering a range of fire resistance periods and wall thicknesses, it is important that fire door assemblies can demonstrate and provide the necessary range of fire resistance data, including the interface of the aperture. (ie lined or unlined openings.

Designers and contractors should collaborate and coordinate the interface between the flexible wall system and fire door assembly. Discussions should be had early in the process (RIBA stage 2) to ensure that the drylining can accommodate the weight and the opening size, and maintain the required performance. This should be addressed before the final draft of the drylining specification.

The drylining opening should be closed off with the same number of layers and type of plasterboard as the system, unless the door assembly manufacturer has test evidence to support otherwise. A consistent approach across the project is recommended.

The specifier should establish the weight of the door, the required opening for the door assembly, and the opening and closing force of the doors to ensure that the door frame jamb and opening can be designed in tandem with the drylining and door set suppliers.

Note: additional structural elements to accommodate the doors may be required. This secondary support may require independent fire protection and could impact the detailing of the drylining adjacent to the doors.

To maintain the integrity of the complete assembly, the interface between the fire door and the partition is extremely important and addressing any gaps between the back of the frames to the drylining and the firestopping should be specified.

The fire resistance of the partition and the door set should be designed in collaboration with all parties to meet the required performance.

POCKET DOORS IN DRYLINING

Where sliding doors are to be incorporated in a 'pocket' in the drylining, the designers should work with the manufacturers of these systems and the drylining manufacturers to coordinate the junction between these systems and the overall thickness of the wall or lining.

Note: the performance of the wall may be impacted by the inclusion of another system within the drylining.

Pocket door

PROJECT PLANNING

Sufficient time should be allocated for procurement, delivery and installation of materials.

Meetings should be held as early as practical with the specialist contractors to ensure all aspects of the specification are understood and the programming is achievable.

SITE CONDITIONS/PROJECT ENVIRONMENT

Drylining is essentially a finishing trade and therefore the building should be in a suitable condition before systems are installed – specifically, watertight.

The manufacturer's recommended site conditions for the installation of its materials should be followed.

Drylining is usually installed in more than one operation. In the case of wall and ceiling linings, a framework may be required before the boards are installed prior to jointing and finishing with either a tapping and filling compound to the joints or tapping and a skim coat of plaster applied to the face of the lining. Partitioning requires a first fix of steel or timber framing before the application of plasterboard and finishing and in all cases fine filling and decoration by others.

Steel framework

See the **FIS SITE GUIDE FOR DRYLINING**
thefis.org/wp-content/uploads/2016/03/FIS-site-guide-drylining.pdf

See the **FIS BEST PRACTICE GUIDE - INSTALLATION OF DRYLINING**
thefis.org/membership-hub/publications/best-practice-guides/installation-of-drylining/

SCHEDULING

Early commitment to the specialist contractors is key to ensure the contractor can schedule resources to allow sufficient time to plan for the installation of the drylining.

Prior to installing the drylining, there must be an allowance to set out all works prior to construction, as this will highlight any issues. These might include ensuring the fixed points of the building are aligned with the grid lines set by the engineers.

Points to be taken into consideration are typically:

Concrete structure - The tolerances allowed in the construction of the structure will be greater than those expected for the drywall.

Mullions/columns to external façade - Where partitions have fixed points determined by the location of the mullions, the tolerance differences may affect the final layout.

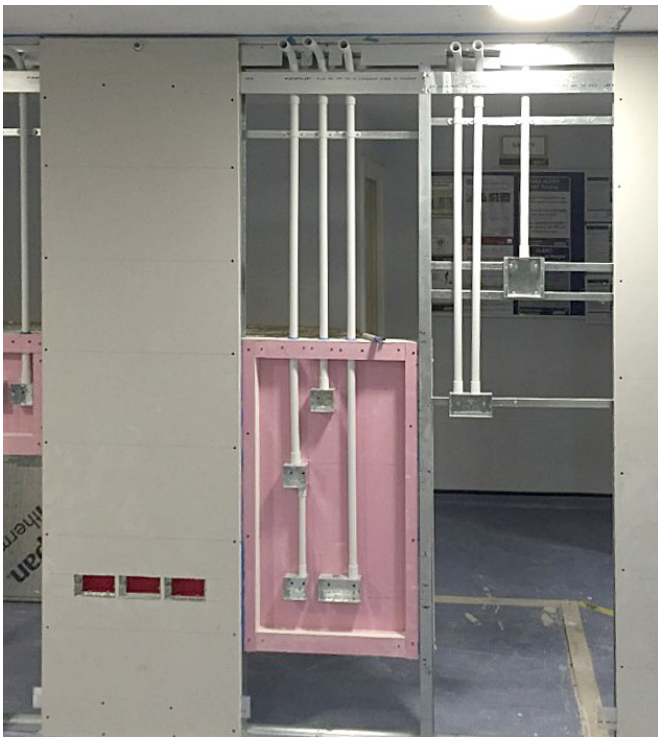
Pods - Typically, off-site manufactured bathroom pods may affect the final layout because their location determines the position of internal partitions.

SFS - Mitigating measures in the external wall systems will be required to maintain the acoustic and fire performance of the partitioning where it interfaces with the external wall.

Early engagement with the mechanical and electrical (M&E) consultants and firestopping specialists is essential to ensure the location of all services are confirmed and firestopping products are compatible – see firestopping clause above.

Ensure that there is a robust quality assurance system in place.

PROJECT PLANNING



Well planned service installations in drylining

Contractors should be able to first fix (framework) and second fix (boarding) to party walls and external linings to provide the main performing elements, fire, acoustic and thermal compartmentation to each unit. This will ensure that all the relevant junctions and details can be closely monitored during construction and the services are installed though prepared openings rather than attempting to install performance compartment walls around the services.

BENCHMARKING

The specification should include this requirement to produce a benchmark in an area that will be available for the duration of the contract, which can be signed off before commencement of the work and used to compare ongoing work in the event of a dispute.

MATERIAL HANDLING

Meetings should be held as early as practical with the main contractor and specialist contractors to ensure that preparation is made for the safe ingress of materials and storage of materials on site in accordance with manufacturer's recommendations.

For recommendations designed to reduce the risk of injury and damage to the materials, see **FIS BEST PRACTICE GUIDE: RECOMMENDATIONS FOR THE SAFE INGRESS OF PLASTERBOARD**

thefis.org/membership-hub/publications/best-practice-guides/recommendations-for-the-safe-ingress-of-plasterboard

MANUFACTURER'S RECOMMENDATIONS

The manufacturer's (system owner's) installation instructions should always be followed. This is especially important where the drylining is expected to satisfy performance criteria.

Note: although different components from different suppliers may look similar, it does not mean that they will provide the same level of performance.

Note: if components in systems are changed, or the recommended installation methods not adhered to, the design and performance levels become the responsibility of the person or organisation that changed them.

The manufacturer or system owner should be consulted if you are considering changing any aspect of the installation or design.

MANUFACTURER INSTALLER SCHEMES

Many system owners can provide a list of contractors who are trained in installing their systems. Where possible, and where warranties are required, these contractors should be approached to provide a cost to supply and install the system.

FIS is the trade body representing the sector. Its members are vetted before joining and then every three years. Members agree to comply with the code of conduct and install products in accordance with FIS good practice guides.

A list of vetted members who supply and install drylining can be found at thefis.org/member-directory/?businesstype=contractors-specialist

INSTALLATION CONSIDERATIONS

Although this guide is written to provide guidance on the specification of drylining, specifiers should ensure that the systems selected can be safely and correctly installed and will achieve the required performance.

For further guidance please refer to:

- BS 8000-8 Workmanship on construction sites – Part 8: Design and installation of drylining systems – Code of Practice
- BS 8212 Code of practice for drylining and partitioning using gypsum plasterboard
- Best Practice Guide Installation of Drylining
  thefis.org/membership-hub/publications/best-practice-guides/installation-of-drylining/
- FIS Site Guide for Drylining
  thefis.org/wp-content/uploads/2016/03/FIS-site-guide-drylining.pdf

COMPETENCE

It is important the organisations and operatives can demonstrate their competence to carry out the work to meet the required performance and quality required.

This can be demonstrated through membership of FIS, evidence of relevant training from the chosen supplier of the system, relevant National Vocational Qualification (NVQ) and CSCS cards of the relevant colour.

thefis.org/members-directory-landing-page/

citb.co.uk/courses-and-qualifications/check-a-card-training-record/online-card-checker/

COMPETENCY FRAMEWORK

A competency framework based on skills, attitude, knowledge and experience (SAKE) was referenced in the CIC Raising the Bar report. Working Group 12 (WG12) has identified that there are four factors that come together to describe competence – known as SKEB:

- Skills
- Knowledge
- Experience
- Behaviour.

These factors – defined, attained, acknowledged and verified – create a formal framework for product competence.

cic.org.uk/admin/resources/raising-the-barinterimfinal-1.pdf

"Anyone who participates in the work must have the appropriate skills, knowledge, experience and behaviours ... Anyone who appoints an organisation ... must ensure they meet the competence requirements for their roles."

BUILDING SAFETY BILL, SECRETARY OF STATE FOR HOUSING, 2020

INSPECTION

When making observations on the quality and flatness of the finished drylining, the same temporary lighting conditions apply as for the application of the drylining finish – washing the wall with high-intensity light is not acceptable. Surfaces can be viewed from positions normally used in the finished building as follows:

- From doorways and from the centre of rooms in a typical dwelling
- From 2m away from the surface in larger rooms
- At eye level in the standing and sitting positions.

QUALITY CHECKS

A quality checklist for drylining has been produced by members of the FIS drylining working group to help members assess risk during the project and provide a detailed quality check list throughout the installation process.

It has been designed to encompass a wide and detailed range of questions which you may choose to consolidate, depending on the performance of the drylining, the evidence you have been asked for or wish to provide, and the known experience and competency of the teams.

It can be downloaded from thefis.org/wp-content/uploads/2019/11/Drylining-quality-checklist.docx

It covers:

- Design
- Procurement
- Delivery
- Installation.

COMMON FAILINGS

Issues that lead to delays, costs and remedial work, according to a recent industry survey:

1 Incorrect selection of fixing

2 Lack of fire strategy drawings

3 Discrepancies or ambiguity within the specification/drawn information

4 Defined design development statements

5 Prepared opening information being unavailable

6 Interface detail being absent from tender documents

7 Door weights missing from tender information

8 Timescales for tender return too tight

9 Lack of compliance with manufacturers' guidance

10 Unachievable performance requirements

11 No consideration of fire protection to steels falling above fire compartment walls maintaining the fire integrity/insulation of the fire compartment.

12 Absence of suitable supporting structure to support drylining works

CHECKLIST

The following checklist has been compiled to help you check that the key issues have been addressed when specifying drylining. It is not exhaustive but a guide to the key issues only.

1 Engage with the manufacturer

2 Read and understand the fire strategy drawing

3 Read and understand the acoustician's requirements for sound insulation, sound absorption and sound diffusion

4 Check all layouts and sections against the requirements for the project and of the Building Regulations, building standards and technical books

5 Check that the specification will meet the requirements for healthcare and education

6 Understand requirements for fire resistance and fire protection

7 Read test evidence of compliance for any performance requirements

8 Coordinate the requirements for the prepared service openings

9. Coordinate the requirements for deflection under live loads

10 Coordinate the requirements to address any other building movement, such as interstory drift

11 Address any issues where sound flanking might occur

12 Address any issues where air leakage might occur

13 Check that the specified system can be installed to the specified/project height and within the fire state maximum height of the system

14 Check that any partitioning being installed to the underside of exposed beams and columns will accommodate deflection, address fire insulation and not impact the passive fire protection

15 Ensure that the specification meets the sustainability requirements from the client

16 Address any requirements where design for security is required

17 Coordinate the installation of door openings to ensure that the size weight and slamming force can be accommodated

18 Address environmental issues such as humidity, wind loading, bacterial and fungal infection

19 Allow for any loads that will be imposed on the drylining, such as furniture, sanitary ware and decorative stone surfaces

20 Ensure that, where applicable, there is a declaration of performance, and the products are UKCA or UKNI marked

21 Ensure that the requirement to install a benchmark sample area is included in the specification

22 Ensure that tolerances are clearly stated using BS 8000-8 or BS 8212

23 Ensure that, where required, fire-resistant partitions take precedence over any other performance requirements (especially at corners and junctions)

APPENDIX

TECHNICAL BOOKLETS

E Fire safety

G Resistance to the passage of sound

F2 Conservation of fuel and power in buildings other than dwellings

buildingcontrol-ni.com/regulations/technical-booklets

WALES – APPROVED DOCUMENTS

labc.co.uk/professionals/building-regulations-guidance-documents/approved-documents-and-technical-guidance-wales

B Fire Safety: Volume 1: Dwellings

B Fire Safety: Volume 2: Buildings other than dwellings

E Resistance to the passage of sound

L2A Conservation of fuel and power in new buildings other than dwellings

L2B Conservation of fuel and power in existing buildings other than dwellings

EDUCATION

Building Bulletin 93: Acoustic Design of schools – performance standards
gov.uk/government/publications/bb93-acoustic-design-of-schools-performance-standards

Building Bulletin 100: Design for fire safety in schools (under review)

HEALTHCARE

Building Bulletin 93: Acoustic Design of schools – performance standards
gov.uk/government/publications/bb93-acoustic-design-of-schools-performance-standards

Building Bulletin 100: Design for fire safety in schools (under review)

HEALTHCARE

Health Building Note: HTN 00-10 Part B: Walls and ceilings

Health Technical Memorandum: HTM 08-01: Acoustics

Health Technical Memorandum: HTM 05-02: Firecode

Health Technical Memorandum: SHTM 60 (Scotland) Ceilings

ADDITIONAL RESOURCES

FIS Best Practice Guides
thefis.org/membership-hub/publications/best-practice-guides/

Installation of Suspended Ceilings

Installation of Drylining

Installation of Partitioning

Selection and Installation of Top Fixings for Suspended Ceilings

Firestopping of Service Penetrations

Maintenance and Access into Suspended Ceilings
thefis.org/membership-hub/publications/maintenance-and-access-into-suspended-ceilings/

A Guide to Office Acoustics
thefis.org/membership-hub/publications/guide-office-acoustics/

FIXINGS

CIRIA (Construction Industry Research and Information Association)
General fixings – Selection and whole life management (C777)
ciria.org

APPENDIX

STANDARDS

BS EN 15254-3:2019
Extended application of results from fire resistance tests. Non-loadbearing walls. Lightweight partitions

BS EN ISO 9001
Quality management systems. Requirements

BS EN ISO 14001
Environmental management systems. Requirements with guidance for use

BS ISO 45001
Occupational health and safety management systems. Requirements with guidance for use

FIRE

BS 9999
Fire safety in the design, management and use of buildings. Code of practice

BS 9991
Fire safety in the design, management and use of residential buildings. Code of practice

FIRE TESTS ON BUILDING MATERIALS AND STRUCTURES

BS 476-4
Non-combustibility test for materials

BS 476-6
Method of test for fire propagation for products

BS 476 - 7
Method of test to determine the classification of the surface spread of flame of products

BS 476-11
Method for assessing the heat emission from building materials

BS 476-20
Method for determination of the fire resistance of elements of construction (general principles).

BS 476-21
Methods for determination of the fire resistance of loadbearing elements of construction

BS 476-22
Method for determination of the fire resistance of non-loadbearing elements of construction

BS 476-23
Methods for determination of the contribution of components to the fire resistance of a structure

BS EN 1182
Reaction to fire tests for products. Non-combustibility test

BS EN 1716
Reaction to fire tests for products. Determination of the gross heat of combustion (calorific value)

BS EN 11925-2
Reaction to fire tests. Ignitability of products subjected to direct impingement of flame. Single-flame source test

BS EN 13823
Reaction to fire tests for building products. Building products excluding floorings exposed to the thermal attack by a single burning item

BS EN 13501-1
Fire classification of construction products and building elements. Classification using data from reaction to fire tests

BS EN 1365-1
Fire resistance tests for loadbearing elements. Walls

BS EN 1365-2
Fire resistance tests for loadbearing elements. Floors and roof

BS EN 1364-2
Fire resistance tests for non-loadbearing elements. Ceilings

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BS EN 13501-2
Fire classification of construction products and building elements. Classification using data from fire resistance tests, excluding ventilation services

ACOUSTICS

BS EN 12354-6
Estimation of acoustic performance of buildings from the performance of elements. Sound absorption in enclosed spaces

BS EN ISO 717-1
Rating of sound insulation in buildings and of building elements

BS EN ISO 354
Measurement of sound absorption in a reverberation room

BS EN ISO 11654
Sound absorbers for use in buildings. Rating of sound absorption

BS EN ISO 10140-3
Measurement of sound insulation in buildings and of building elements. Laboratory measurement of airborne sound insulation of building elements

BS EN ISO 10848-2
Laboratory and field measurement of flanking transmission for airborne, impact and building service equipment sound between adjoining rooms. Application to Type B elements when the junction has a small influence

BS EN ISO 140-18
Measurement of sound insulation in buildings and of building elements. Laboratory measurement of sound generated by rainfall on building elements

COLOUR / GLOSS / LIGHT REFLECTANCE

ISO 12944-3
Paints and varnishes. Corrosion protection of steel structures by protective paint systems. Design considerations

BS EN ISO 2813
Paints and varnishes. Determination of gloss value at 20 degrees, 60 degrees and 85 degrees

BS 8493
Light reflectance value (LRV) of a surface. Method of test

THERMAL

BS EN ISO 10456
Building materials and products. Hygrothermal properties. Tabulated design values and procedures for determining declared and design thermal values

BS EN ISO 10211
Thermal bridges in building construction. Heat flows and surface temperatures. Detailed calculations

BS EN ISO 6946
Thermal bridges in building construction. Heat flows and surface temperatures. Detailed calculations

BS EN 13162
Thermal insulation products for buildings. Factory made mineral wool (MW) products. Specification

BS EN 13171
Thermal insulation products for buildings. Factory made wood fibre (WF) products. Specification

BS EN 12664
Thermal performance of building materials and products. Determination of thermal resistance by means of guarded hot plate and heat flow meter methods. Dry and moist products of medium and low thermal resistance

BS EN 12667
Thermal performance of building materials and products. Determination of thermal resistance by means of guarded hot plate and heat flow meter methods. Products of high and medium thermal resistance

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BS EN 12939
Thermal performance of building materials and products. Determination of thermal resistance by means of guarded hot plate and heat flow meter methods. Thick products of high and medium thermal resistance

BS EN 10456
Building materials and products. Hygrothermal properties. Tabulated design values and procedures for determining declared and design thermal values

UPVC

BS EN 13245-1
Plastics. Unplasticized poly(vinyl chloride) (PVC-U) profiles for building applications. Designation of PVC-U profiles

BS EN 13245-2
Plastics. Unplasticized poly(vinyl chloride) (PVC-U) profiles for building applications. PVC-U profiles and PVC-UE profiles for internal and external wall and ceiling finishes

METAL

BS EN 573-3
Aluminium and aluminium alloys. Chemical composition and form of wrought products. Chemical composition and form of products

BS EN 1396
Aluminium and aluminium alloys. Coil coated sheet and strip for general applications. Specifications

BS EN 10143
Continuously hot-dip coated steel sheet and strip. Tolerances on dimensions and shape

BS EN 10152
Electrolytically zinc coated cold rolled steel flat products for cold forming. Technical delivery conditions

BS EN 10169
Continuously organic coated (coil coated) steel flat products. Technical delivery conditions

BS EN 10346
Continuously hot-dip coated steel flat products for cold forming. Technical delivery conditions

BS EN 10211
Chemical analysis of ferrous materials. Determination of titanium in steels and cast irons. Flame atomic absorption spectrometric method

TIMBER / PARTICLE / FIBRE BOARDS

BS EN 622-1
Fibreboards. Specifications. General requirement

BS EN 312
Particleboards. Specifications

BS EN 335
Durability of wood and wood-based products. Use classes: definitions, application to solid wood and wood-based products

BS EN 350
Durability of wood and wood-based products. Testing and classification of the durability to biological agents of wood and wood-based materials

BS EN 351-1
Durability of wood and wood-based products. Preservative-treated solid wood. Classification of preservative penetration and retention

BS EN 351-2
Durability of wood and wood-based products. Preservative-treated solid wood. Guidance on sampling for the analysis of preservative-treated wood

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BS EN 460
Durability of wood and wood-based products. Natural durability of solid wood. Guide to the durability requirements for wood to be used in hazard classes

BS EN 1912
Structural Timber. Strength classes. Assignment of visual grades and species

BS EN 599-1
Durability of wood and wood-based products. Efficacy of preventive wood preservatives as determined by biological tests. Specification according to use class

BS EN 599-2
Durability of wood and wood-based products. Efficacy of preventive wood preservatives as determined by biological tests. Labelling

BS EN 1912
Structural Timber. Strength classes. Assignment of visual grades and species

BS EN 1991-1-6
Eurocode 1. Actions on structures. General actions. Actions during execution

BS EN 1995-1-2
Eurocode 5. Design of timber structures. General. Structural fire design

ENVIRONMENTAL

BS EN ISO14025
Environmental labels and declarations. Type III environmental declarations. Principles and procedures

BS EN 15804
Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products

BS EN 12460-5
Wood based panels. Determination of formaldehyde content. Extraction method called the perforator method

BS EN 717
Wood-based panels. Determination of formaldehyde release. Formaldehyde emission by the chamber method

BS EN 16000-9
Indoor air. Determination of the emission of volatile organic compounds from building products and furnishing. Emission test chamber method

OTHERS

BS 8000-0
Workmanship on construction sites. Introduction and general principles

NA to BS EN 1998-1
UK National Annex to Eurocode 8. Design of structures for earthquake resistance. General rules, seismic actions and rules for buildings

BS EN ISO 14644-1
Cleanrooms and associated controlled environments. Classification of air cleanliness by particle concentration

BS 8539
Code of practice for the selection and installation of post-installed anchors in concrete and masonry

BS7671:2018+A1:2020
Requirements for Electrical Installations. IET Wiring Regulations

APPENDIX

Standard method of publishing performance data for suspended ceiling and absorbers

MANUFACTURER				PRODUCT NAME		REFERENCE	
				Specification requirement			
	Parameter	Value	Standard	Regulation	Other	Test report number	Assessment report number and expiry
1	**Acoustics**	α_w 0-1.00 Absorption classes A-E	**Absorption** BS EN ISO 354 (under review) BS EN ISO 11654	Approved Document E Common Parts Education BB93 CPR CE marking	LEED, SKA Rating, BREEAM, Well Building standard Health HTM 0801		(include air gap behind panels during test)
		D_{nfw} double pass R_w single pass	**Attenuation** (sound insulation) BS EN 140-3 BS EN ISO 10140 BS EN ISO 717-1 BS EN ISO 10848-2	Education BB93 Health HTM 0801	LEED, SKA Rating, BREEAM, Well Building standard		
2	**Fire**		**Reaction to Fire** EN13501-1	Approved Document B CPR CE marking	BS 9999 BS 9991		
		In minutes **R** Resistance / load bearing capacity **E** Integrity **I** insulation	**Resistance to fire** BS476-20-21-22-23 BS EN 13501 EN1365-2 EN13381 EN 1364-2	Approved Document B CPR CE marking	BS 9999 BS 9991		
3	**VOC**	E1 rating	BS EN 717	CPR CE marking	LEED, SKA Rating, BREEAM, Well Building standard		
4	**Sustainability**		Environmental Product Declaration (EPD) ISO 14025 BS EN 15804	LEED, SKA Rating, BREEAM, Well Building standard			
5	**Recycled content**		Environmental Product Declaration (EPD) ISO 14025 BS EN 15804	LEED, SKA Rating, BREEAM, Well Building standard			
6	**LRV**	%	ISO 7724-2-3 BS 8493		LEED, SKA Rating, BREEAM, Well Building standard		
7	**Humidity**	% RH Class A, B, C, D	BS EN 13964				
8	**Hygiene**	Class 1-12	ISO 14644:1		Health HTM 0801		
9	**Clean room**	Class 1-12	ISO 14644:1	Euro codes			
10	**Corrosion**	A, B, C, D	BS EN 13964 BS EN ISO 12944-2(1) Note: needs more clarification		SCI		
11	**Thermal conductivity**	(W/Mk)	BS EN 12664 BS EN 12667 BS EN 12939	Building Approved document L			
12	**Impact resistance**	Class 1a 2a 3a	BS EN 13964	CPR CE marking	Education leisure and sports		
13	**Wind loading**		Individual engineered solution				
14	**Tolerances**		BS EN 13964	CPR CE marking			

APPENDIX

NBS SPECIFICATIONS

thefis.org/wp-content/uploads/2019/12/FIS-Drylining-CAWS-in-Chorus.pdf

thefis.org/wp-content/uploads/2019/12/FIS01-Drylining-Uniclass-in-Chorus.pdf

NBS CLAUSES

Individual clause numbers applicable to drylining (in this section) are:

115 Metal stud partition system – non-proprietary specification
125 Metal stud partition system – proprietary specification
145 Wall lining system (metal studs) – non-proprietary specification
155 Wall lining system (metal studs) – proprietary specification
165 Wall lining system (metal framing)
175 Wall lining system (metal furrings)
185 Wall lining system (adhesive)
205 Lining on timber framed walls/ partitions
255 Encasement system (metal framing)
265 Encasement system (frameless)
275 Encasement on timber framing
401 Gypsum plasterboard
402 Gypsum plasterboard (vapour control)
403 Gypsum plasterboard (moisture-resistant)
404 Gypsum plasterboard (improved fire protection)
406 Gypsum plasterboard (improved fire protection and moisture-resistant)
407 Gypsum plasterboard (improved fire protection and vapour control)
408 Gypsum plasterboard (impact-resistant)
409 Gypsum plasterboard (improved sound insulation)
410 Gypsum plasterboard (improved sound insulation and moisture-resistant)
415 Gypsum plasterboard (not covered above)
420 Gypsum fibre board
421 Gypsum fibre board (enhanced density)
422 Gypsum fibre board (reduced water absorption)
423 Gypsum fibre board (enhanced surface hardness)
424 Gypsum fibre board (enhanced strength)
425 Gypsum fibre board (reduced surface water absorption)
426 Gypsum fibre board (not covered above)

UNICLASS CODES FOR DRYLINING

Ss_25_10_30_35	Gypsum board partition systems
Ss_25_12_65_60	Plasterboard laminated partition systems
Ss_25_12_65_65	Panel partition systems
Pr_25_71_35	Gypsum boards and sheets
Pr_25_71_35_06	Gypsum baseboards
Pr_25_71_35_11	Carbon-neutral gypsum plasterboards
Pr_25_71_35_12	Carbon steel-faced plasterboard panels
Pr_25_71_35_15	Gypsum core boards
Pr_25_71_35_21	Enhanced strength gypsum plasterboards
Pr_25_71_35_29	Fibre-reinforced gypsum boards
Pr_25_71_35_30	Fibre-reinforced gypsum floor boards
Pr_25_71_35_32	Flexible plasterboards
Pr_25_71_35_33	Fire-resistant gypsum plasterboards
Pr_25_71_35_37	High-density gypsum plasterboards
Pr_25_71_35_42	Impact-resistant gypsum plasterboards
Pr_25_71_35_52	Moisture-resistant gypsum plasterboards
Pr_25_71_35_61	Gypsum planks
Pr_25_71_35_63	Plasterboard panels
Pr_25_71_35_65	Gypsum plasterboards
Pr_25_71_35_67	Gypsum plasterboard with combined properties
Pr_25_71_35_77	Gypsum sheathing plasterboards
Pr_25_71_35_80	Sound insulation gypsum plasterboards
Pr_25_71_35_84	Standard gypsum plasterboards
Pr_25_71_35_88	Thermal laminate gypsum plasterboards
Pr_25_71_35_94	Vapour check gypsum plasterboards
Pr_25_71_35_99	X-ray-resistant gypsum plasterboards

GLOSSARY

Manufacturer is defined as "any natural or legal person who manufactures a construction product, or has a construction product designed or manufactured and places it on the market under their own name or trademark". Further, the responsibility of the manufacturer is placed on any person who changes the intended use of a construction product in such a way that different essential or other legal requirements will become applicable, or substantially modifies or re-builds a construction product (thus creating a new construction product), with a view to placing it on the market or for putting it into service.
cpicode.org.uk/wp-content/uploads/2021/09/Code-for-Construction-Product-Information-v1-0.pdf

System owner - person or organisation that owns the performance evidence of a system BS8000-8

Proprietary system - in the context of this statement, a proprietary system is a system from a system owner where a direct technical claim of performance is made.

The system's performance depends on the complete system using components supplied by one organisation. The substitution of any system component may prejudice the system's performance.

Doorsets are door leaves and door frames that are factory prepared and fitted with the hinges, latches, locks, seals and, when required, closers and intumescent strips needed for the door to perform.

Door kits are effectively doorsets but supplied in two or more parts to be assembled on site. Both doorsets and door kits are supplied from a single source. Where the final assembly created on site is formed from components from more than one source then this is a 'door assembly'.

FINISHES & INTERIORS SECTOR

SPECIFIERS' GUIDE
DRYLINING

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